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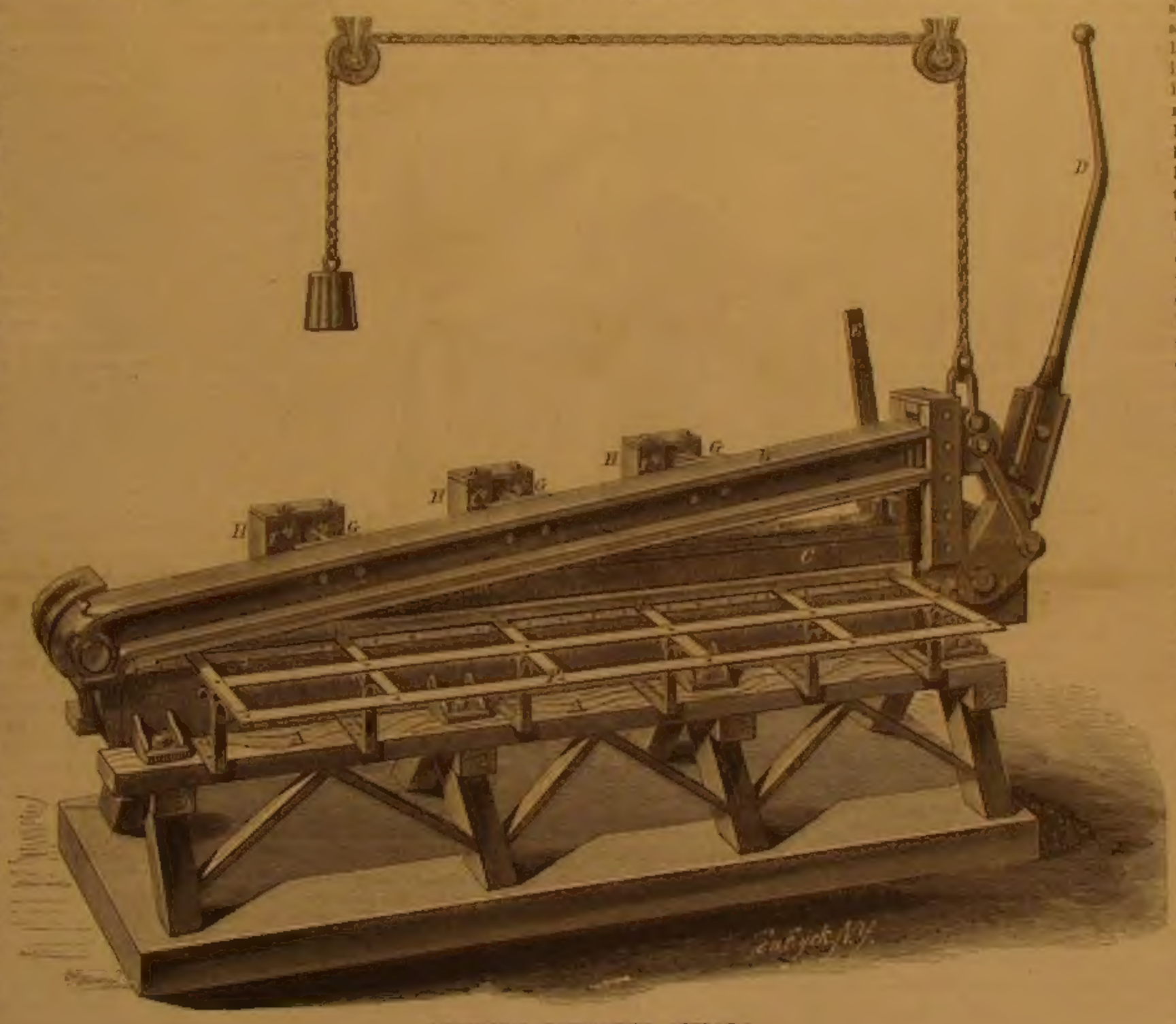
The Qualities Required in a Good Shears for Cutting Iron or other Metals.

The qualities requisite to a good shears for cutting metals are that the power required to do the work shall be distributed equally throughout the stroke; that the rate of cutting shall be uniform throughout the stroke; that the piece to be cut shall be held firmly in such a manner that all wrinkles or bends shall be removed from the part to be cut; that the edges of the blades shall pass each other at an equal distance throughout the stroke, and as near to each other as possible without mutual abrasion; and that the parts of the machine shall be so proportioned and adjusted as not to spring or to give any approximation to a drawing stroke in the blades. These, with the minor details of adjustment for different kinds of work, constitute the essentials of a good shears.

The principle of action in the shears and the punch is identical. The punch is only a modification of the shears.

The points above enumerated are not always easy to secure by simple means, where the blades of a shears are required to be of great length. As near an approach to their perfect attainment as we have ever met with has been secured in the invention we herewith illustrate. Having personally witnessed its operation we are prepared to testify to the very superior character of the work it performs.

Born of a necessity this invention admirably illustrates the old adage. The firm of Nichol & Billerwell, of New York city, manufacturers of ironwork—iron shutters and other architectural work—having taken a heavy contract at rates which subsequent circumstances threatened to make ruinously losing, the senior partner, Mr. Nichol, set himself to work like an able general, to turn defeat into victory. The result was the invention of this shears, the use of which enabled the firm to save themselves a large loss, and to realize a fair profit instead.



NICHOL'S IMPROVED SHEARS.

In the engraving, A represents the framework of wood upon which the machine rests, B the movable cutter-bar, and C the clamp which holds the work. The movable cutter-bar is worked with a lever, D, so connected with the cutter-bar by pivoted bars, that as the leverage of the shear blade is diminished, during the progress of the stroke, the leverage of D is increased to compensate for the loss, thus rendering the power required to work the shears uniform throughout the stroke. The clamp, C, consists of a straight square bar held by set-screws and attached by them to an angular casting, the cross section of which would be shaped like the letter L inverted. This casting extends over the whole length of the square bar, and with it forms the body of the clamp, the set screws passing at equal intervals through it, serving to adjust the clamp for different thicknesses. This clamp is worked by a lever, E, so arranged that the clamp is thrown uniformly down upon the work, or rather falls by its own weight by raising the lever. To the lever is attached an arm which, when the lever is depressed, raises the clamp and holds it during the adjustment of the work. A metallic rack, F, serves to hold the plate to be cut, which is slid in to meet a system of gages not shown in the engraving.

To the back side of the cutter bar, B, are bolted arms, G, which have friction rollers at the ends remote from the cutter bar, rolling against the back of the plates, I, attached to the standards, H. The plates, I, are slotted to admit the motion of the arms, G, and are adjusted by set screws so that the edges of the shear blades can be brought and held closely together. This arrangement also prevents any lateral spring.

In order to secure a uniform rate of cutting, the movable blade has a curved or bellying edge, so calculated that the latter end of the stroke cuts no faster than the first. The cutter bar, B, is raised by a chain and weight running over pulleys, as shown in the engraving.

There is little doubt that for cutting sheets this shears is not excelled. It cuts perfectly clean, and leaves no burr. Before its use in the establishment of Messrs. Nichol & Billerwell, all the slats cut by them needed to have the edges dressed by the file. Slats cut by these shears are not touched with the file at all. Sheets of metal ten feet in length may be placed in these shears, and a mere shaving of uniform thickness and perfectly unbroken, taken from the edge the entire length, and what is still more astonishing, such a cut—a mere thread—is not curled or twisted. This could never be accomplished by a shears having any lateral spring to the blade. The cut is made for the ten feet as rapidly as it could be done for ten inches. When working the average number of cuts made per day is 2,400, requiring a force of two ordinary laborers and two boys. It is perfectly easy to apply steam or water power to the operation of this shears by means that will suggest themselves to any mechanic. We are informed by the inventor that its use saves half the labor of any other machine now in use for cutting iron, a result which we can readily credit, having seen the machine at work, and noted the excellent character of the work performed.

The patentee will sell rights for all States except New York. The patent for this invention was obtained through the office of the Scientific American Patent Agency, May 18, 1869, by John Nichol of the above-named firm.

The machine may be seen in operation at the works of Nichol & Billerwell, 220, 223, and 224 West Houston street, New York, to whom all communications may be addressed.

A NEW illuminating mixture consists of two parts rapeseed oil and one of petroleum oil.

SEA CABLES.

The cables to be submerged in the Black Sea are, by this time, completed, and in a few weeks will be on their way to their submarine destination. In order to avoid the mountainous range of the Caucasus, the Indo-European Telegraph Company (the progress of whose works we lately alluded to), determined to lay a cable from the Crimea to a point on the Asiatic shores of the Black Sea, considering that the difficulties of the submarine would be far less than those of the mountainous route, the probability of interruption in the former being much less. The original cable route was not adhered to, but a shorter route finally settled upon, the length of cable being 100 miles, starting from a point near Djulfa, on the Black Sea, and landing at Suchum Kaleh. The second section of cable is that for the Straits of Kertch, a three-wire cable of heavy proportions. The insulated core of the Black Sea cable is similar to that of the cables that are generally known—a stranded conductor surrounded by coats of gutta-percha.

The insulated conductors in this cable are three, each of them weighing 273 lbs. per nautical mile (copper, 107 lbs. per mile; gutta-percha, 166 lbs. per mile). It is in the materials specially used for strengthening and preserving the core that this cable so essentially differs from all others. Its construction is similar in every respect to some small cables made by Messrs. Siemens Brothers, for the French Government, some few years ago, and laid in the Mediterranean, on the place designed and specially advocated by Mr. C. W. Siemens. The present cable has been manufactured at the works at Charlton. In the ordinary system of cable making, the core is protected with a serving of hemp, and sheathed externally for extra protection, and for strength, with a helical covering of iron wires; the number and size of which depending upon the size of the core and the locality for which the cable is intended. In Siemens' cable, however, the main strength rests in a large serving of best Italian hemp, giving it the character of a rope; this serving is protected (adding, at the same time, some strength to the cable) by a sheathing, laid helically, of strips of flat copper of about ⅛in. in diameter.

The copper selected is of the best quality, and arrives in the shape of long broad sheets. These sheets are first passed through the shearing machine, where, by means of knives placed above and below, the entire sheet, as it passes through, is divided throughout its breadth into equal narrow strips of the breadth required for sheathing the cable. On coming away from the shearing machine the strips are wound on small bobbins. If a strip of metal or anything be attempted to be wound around a long cylinder, it will infallibly bulge up and tend toward the trumpet form, and in order to prevent such a result happening to the copper strip in the cable, it undergoes a process termed "rabbiting." Each strip, before going to the sheathing machine, passes through this operation, which consists in slightly bending its edge and grooving its centre. The bobbins, of prepared copper, are then taken to the closing machine, for the final process, but we must first describe the ordinary covering with hemp.

The three insulated wires of the Black Sea cable are served

together and wormed, the worming consisting of a number of strands of best Italian hemp. In compound cables some difficulty is experienced (unless special marking be adopted), of knowing one wire from another. In the present cable, Mr. Siemens adopts the simple but excellent plan of passing along with one of the hemp wormings, a white tape, which serves as a zero line. After being twisted together and wormed, the core receives its strengthening protection by being served with two servings of best Italian hemp. Each serving consists of about twenty compound strands of hemp, served under tension, and with a very short lay. The second serving is in the reverse direction to the first. After this serving, the cable receives its external protection of copper sheathing, which consists of four strips of the prepared copper, laid helically, one strip overlapping the other for one half its breadth. In consequence of the strip being previously prepared, the cable comes out nice and smooth, and coils most readily, being exceedingly flexible and easily managed. The strips of copper are soldered into continuous lengths, care being taken that no two joints be allowed within a certain distance of each other.

In the manufacture of these cables, the whole process goes on at the same time, and really in the same machine. By the application of the same power, the wires are stranded and wormed, served, and finally sheathed in one continuous machine. Usually, these operations are separate and distinct; the core is commonly stranded, wormed, and served in one machine, and afterward finally sheated. At Charlton, these several operations are conducted on the same machine (or, rather, combination of machines), at the same time. Where space is an object, this plan is, undoubtedly, advantageous; but otherwise, where there is plenty of room, we cannot but think that time must be lost. Anything required to be done to any one part, necessitates a stoppage of the whole. The jointing of the gutta-percha wire, the replacing a hemp bobbin, or the jointing of an external wire, each must stop the whole machine; whereas, in separate machines, only one is stopped at a time.

The specific gravity of the copper sheathed cable in 1·6; its weight a little over 2 tuns; and, although apparently showing but slight signs of strength, its breaking strain is considerably more than would be imagined, amounting to nearly 5 tuns. The shore ends are of heavy iron wires, and of the usual construction. The Kertch cable is also an iron covered cable, but the core consists of three wires insulated with Hooper's material. The iron wires are protected externally with a serving of tarred hemp, and the whole weighs about 12 tuns to the mile. The steamer *Hull* has been engaged for the work, and fitted up with the necessary watertight iron tanks, which are three in number. They are placed in the fore and main holds, the forward containing the Kertch cable; the main, the Black Sea (copper sheathed) cable. Over the fore tank, when the cable is in, will be placed a second tank to receive the shore ends of the Black Sea cable. The paying out and picking up machinery, with engines, have been constructed by Messrs. Easton & Amos, and are placed at the stern of the vessel, the paying-out machine being used, if required, for picking up. This machine is so arranged that at any moment it can be stopped and the engine attached to it, in order that the cable may be drawn in to any distance. The engine is supplied with steam either from the main boiler or the donkey. There are some special features of interest relative to the friction brake and the dynamometer, which call for attention, but we regret that want of space compels us to postpone our notice of them to a future occasion.

It is expected that the vessel will leave at the end of this month or the beginning of the next. Mr. C. W. Siemens goes out with the vessel, and will superintend the operations in connection with laying the cable; and we trust that the expedition will meet with all success—completing successfully an important section in the system of the Indo-European Telegraph.—*Mechanic's Magazine.*

Threatened Extinction of Patent Rights.

To the brainworkers of England we appeal for support in resisting the attempt now commencing in the House of Commons to deprive them of all prospects of reward for their labors. The assault is to be made in the basest spirit of ingratitude by one of our commercial men, who himself has already profited, as have all his class, by the efforts of inventors. To those of our legislators who profess to regard as of the highest moment, the interests and welfare of the working classes, we need scarcely urge that here is a crucial test for their sincerity. To both, we say, rally round your flag and do not permit this suicidal folly to be perpetrated, even though a few narrow-minded manufacturers may be found so devoid of common sense as not to perceive that they would but undedge the tools with which alone they can hope to work effectively, and maintain the supremacy of this country in the mechanical and chemical arts, if indeed they have failed to discover that competition with our foreign rivals cannot be met except by cheapened productions. Yet cheapened production can only be effected by inventive genius, which merely asks for and is entitled to its fair reward, and no manufacturer has any right to demand exceptional legislation in order to rob others that he may be profited.

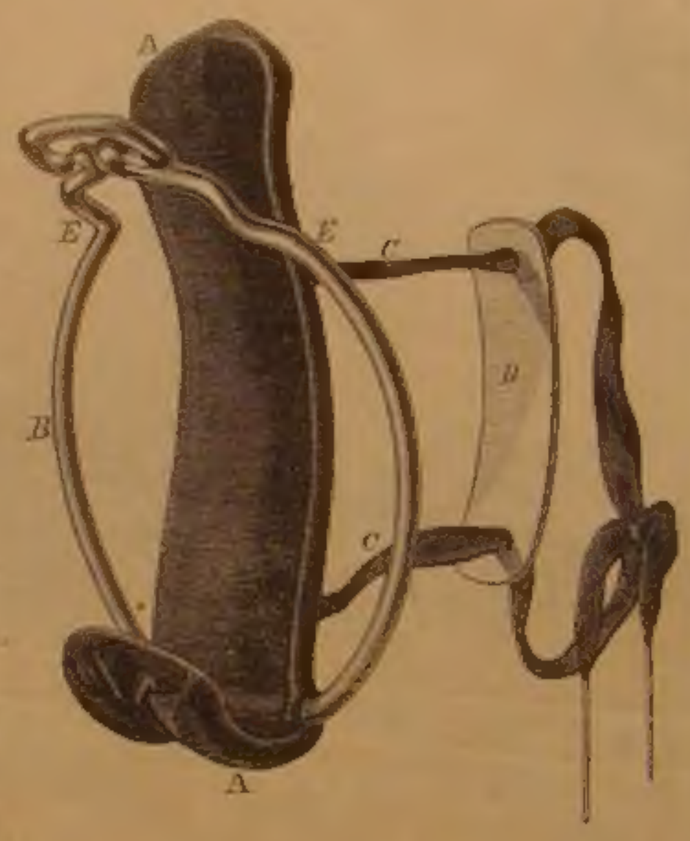
Were the blow simply aimed at the existing patent laws, so that a more sensible procedure, a more complete protection, and cheapened charges, might be exchanged for the perverted system we have so long and persistently condemned, the change would have commanded our heartiest support, as it has now our firmest opposition. But such is not the object of Mr. Maclie, M.P., who has long been known as the ringleader of those who expect inventors, without fee or reward from them, to work for their benefit. He is also one of the ablest exponents of a theory, fallacious in its assumptions, savoring of the wildest socialism and the most despicable selfishness, a theory which, if put in practice, would bring ruin and destruction upon all our industries.

Now, if ever, is the time for all who have at heart the interests of invention, of science, of industrial progress, and who desire to maintain for this country that proud position which it has acquired among the nations as the initiator of the steam engine, the railway, and the electric telegraph, to join, as one man, not only in converting this audacious attack into a triumphant vindication of popular right and justice, but to stand forth as the liberators of the inventive genius of England from its final shackles, by obtaining for the poorest inventor a property in the fruits of his labor as simple and perfect as that which the law already confers on books or works of art.

Had an M. P.—a publisher for instance—given notice that he would move in the House of Commons a similar resolution affecting the existence of the law of copyright, there is not a thinker or writer in the land who would not join heart and hand in denouncing so revolutionary and infamous a proposition. On our part, no effort shall be wanting to show Mr. Maclie that he shall not with impunity enter upon his course of spoliation; and we cannot more appropriately conclude this appeal than by quoting the soul-stirring words of the immortal Nelson—"England expects every man to do his duty."—*Scientific Review.*

WATCH PROTECTOR.

The device shown in the engraving which accompanies this sketch is one likely to render the profession of the light-fingered gentry much less profitable than heretofore. By its use the watch is so firmly held in the pocket, that a snatch-thief or pickpocket, must, in order to take it, take also the garment, or least a portion of it.



In the engraving, A represents a plate of brass swaged to the proper form and covered with velvet. To the lower end of A, which is recurved, is attached a ring of smooth wire, so made that the plate, A, and the ring, B, spring together with considerable force. To the back of A, are attached strings or cords, C, which, when the protector is placed in the fob, pass through eyelets made in the back of the fob, and after being passed through holes in the plate, D, are firmly tied, thus fastening the instrument firmly to the garment in which the watch is carried.

When thus attached the watch is slid in between the top of the ring, B, and the plate, A, and the lower part of the case rests upon the recurved portion of A. The plate, A, and the ring, B, then close by their elasticity, which brings the shoulders, E, directly over the top of the case, while the stem of the guard ring passes through between them. When thus closed no amount of pulling will remove the watch, until the ring, B, is made to open away from the plate, A. This is accomplished with an easy manipulation by the wearer of the watch, but one which if attempted by a pick-pocket would infallibly lead to his detection.

This device was patented by E. R. Pease, April 14, 1868, whom address for territorial rights, at Poughkeepsie, N. Y.

Geo. E. Ranous, 35 Maiden Lane, New York city, is agent for the sale of the article.

The Captive Balloon.

Those who visited Paris during the last Great Exhibition will, doubtless, remember M. Giffard's captive balloon, and the machinery by which the ascents and descents were regulated. This machinery has now been brought to London, together with a balloon 33ft. larger in diameter than the Paris balloon, and a rope of much greater length. On entering the Ashburnham Park, the visitor finds himself in a circus 246ft in diameter, encircled by a screen of timber framing, 80ft in hight, and covered with canvas. In the center of this arena is a well about 15ft deep, over which the balloon, when not on a journey, is held in place by numerous guy ropes. This balloon is 93ft in diameter, and when inflated contains 421,161 cubic feet of gas, pure hydrogen being the gas used. The material of which the balloon is constructed is composed of one layer of linen interior, united to another layer of the same material, by means of a solution of India-rubber. Outside of this is a layer of Cretonne linen, the attachment being formed by a vulcanized India-rubber composition. The exterior is finished with two coats of gum shellac varnish, over which again are laid fine coats of boiled linseed oil. From the balloon is suspended a circular car, having the center open for the passage of the rope, which is attached directly to the body of the balloon. The car will accomodate about twenty-five persons; this was, in fact, the number that made the ascent to which we have referred. The rope is made fast to a pressure gage, having a horizontal dial, upon which a pointer indicates the strain put upon the rope at any moment. The balloon weighs 6,000 lbs; the core netting, with which it is covered, and the necessary guy ropes, etc., which are very numerous, are stated to weigh 4,000 lbs.

The main rope by which the balloon is held captive, weighs 4,350 lbs., is 2,150 feet in length, and is 2¾ in. in diameter at the end next the balloon, gradually tapering to 2 in. diameter at the end next the winding drum. The object of thus tapering the rope, is that its weakest part may be nearest the ground, at which point it would first give way. If it broke at all—which is hardly probable. By this means, if such an event should take place, there would be no danger to those below, from a heavy mass of rope falling upon them. It would also act somewhat as a brake upon the balloon, which would otherwise shoot upwards at a terrific rate, when suddenly relieved of its load. The rope passes from the balloon over a pulley wheel 5 ft. 6 in. in diameter, which is so arranged that it allows the rope to pass freely over it, no matter what angle it may take. It is, in fact, swiveled horizontally and vertically, and has a heavy counter-balance weight attached to it. This pulley wheel is held down by a strong framework, which is built into the earth, and is weighted with 50 tuns of brick, iron, and timberwork. The rope passes horizontally from the pulley along a gradually widening tunnel to the winding drum which is placed at the far side of the circus. This drum is 23 ft. in length and 7 ft. in diameter. It is cast in lengths, and is grooved to receive the rope. The drum is surrounded by a platform, at each end of which is a double-cylinder steam engine of horizontal construction. These engines drive the drum by means of toothed gearing; they receive steam from two vertical boilers placed in the rear of the circus. The boilers are of French construction, by M. Duresnes, as are also the engines, which are by M. H. Flaud. The winding drum was made in London by M. Babcaud, the engineer in charge of the balloon machinery.

On a piece of spare ground in the rear of the circus is the apparatus for producing the gas. This consists of a series of wooden vats in which scrap iron is placed in a solution of sulphuric acid. The gas is drawn off to a receiver, and is made to pass through a washer and a purifier, after which it is stored in a gas holder ready for use. The balloon is always kept inflated, but there is always a loss going on from condensation, the deficiency being made good every evening. The cost of the balloon and apparatus has been something considerable, as will be seen from the following items: Cost of balloon, £3,000; netting, guy, and other necessary ropes, £2,000; main holding rope, £220; engines, boilers, and machinery to work the balloon, £4,000; gas works, £1,200. These items—which are not all that could be enumerated—represent the respectable sum of £9,420, and when we add that the gas for one inflation costs £600, it will be seen that M. Giffard has made an investment of no light nature, but which we trust will prove as satisfactory to himself as his balloon will prove attractive to the public. A careful examination of the whole apparatus has satisfied us that everything is as safe as human ingenuity and foresight can make it. Two experienced aeronauts, MM. Godard and Ayme, accompany each ascent, while the manager is M. Yon, who manufactured the whole of the ropes and netting, and also constructed the balloon for M. Giffard. We can but wish success to this novel enterprise, which we are sure will be well patronized by the public, whenever the weather will permit of ascents being made. There is now no excuse for the public not enjoying the privilege of a balloon ascent, which luxury has hitherto only been allowed to a select few.—*Mechanics' Magazine.*

THE London *Court Journal* contains the following notice of the apparatus employed in printing the *Times*. "The *Times* is now printed by new machinery so perfect and so simple, that it takes but one engineer and three laborers to print off the whole edition of the *Times*. The principle of the machine is that the paper is not cut into sheets before it is printed, but is brought to the machine in a long roll. It passes through the machine, is printed on both sides, and is divided as it passes out, the whole process being automatic. The idea has long been worked at by engineers, but has only lately been practically carried out, under the superintendence of Mr. Macdonald, the engineer, who has charge of the whole *Times* machinery." Four of these machines are in the printing department of that paper. This machine appears to be the same as the Bullock Press now used to print some of the newspapers of this city.

THE *Press* says: "A new era in scientific education has been inaugurated by the management of Lafayette College, Easton, Pa. The scientific classes of that institution will make a tour of the State during this month. They will be under control of one of the leading professors, and will visit points of mining and manufacturing interest. When nature is made the class-room, American youth must needs acquire the highest order of education. Perfection in this respect is not perfect unless it is practical, and practicability is the result of the system introduced by Lafayette."

Treatment of Disease by Inhalation.

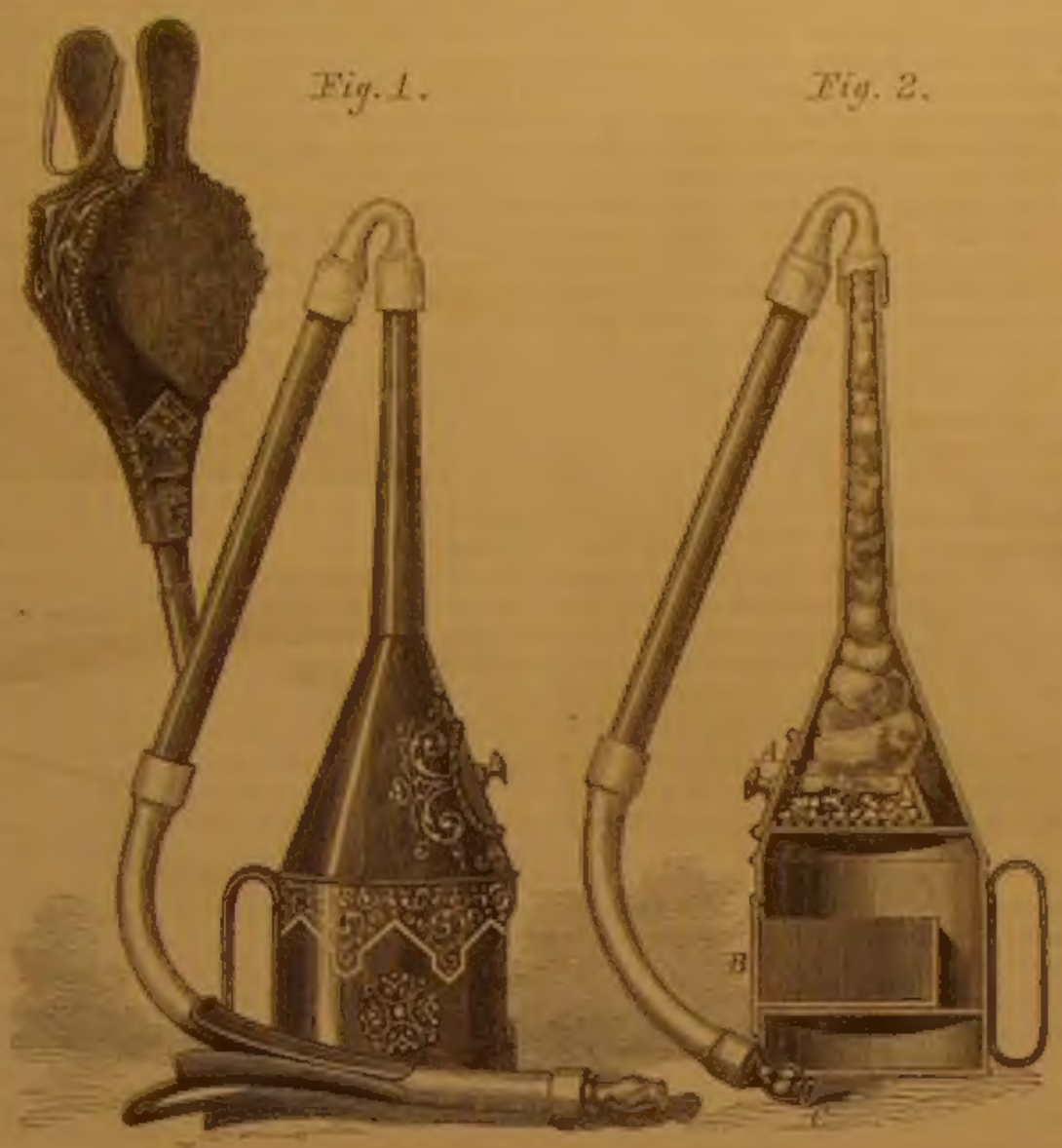
The treatment of certain diseases by inhalation, has advantages that do not pertain to any other method of administering drugs. In lung and throat diseases the parts may by this method be treated by direct application of the remedial agent to the diseased part, and in diseases of the uterus and vagina, the application of medicated vapors insures intimate contact of the remedies with the parts affected, when a proper apparatus is used for the purpose.

The inhaler, patented December 26, 1868, by G. H. Tichenor, M.D., of Canton, Mississippi, is designed to facilitate the process of inhalation and to enable it to be performed in a more perfect manner, than can be done by any of the means previously employed. Its construction is simple and will be easily understood by reference to the engraving which accompanies the description of the improvement.

Fig. 1, is an elevation of the complete apparatus, and Fig. 2 is a vertical section showing the interior construction. The apparatus may be made of tin, sheet iron, or other suitable material, and the general form is that of a cylinder surmounted by an inverted funnel. It contains an upper drawer, A, with a perforated bottom, and a lower drawer B. In the upper drawer is placed the drug or compound, of which the vapors are desired to be inhaled. In the bottom drawer is placed the coals, or preferably a piece of heated iron. The heat radiating against the bottom of the drawer, A, volatilizes or ignites the substances placed in A, and thus the vapors are formed. The drawer, B, is left partially open while the vapor is generating and admits atmospheric air which becoming heated rises and passes through the perforations in the bottom of the drawer, thus diluting the vapor. The amount of dilution is regulated of course by the amount of opening of the drawer, B. From the top of the inverted funnel passes a tube composed at each end of vulcanized rubber, to give flexibility and terminating in a mouth-piece, C. The medicated vapors rising through the funnel, as shown in the engraving, pass through this tube with considerable force, on account of the draft occasioned by the heat, and are then inhaled by the patient.

When the uterus or vagina are under treatment, the drawer B, is closed and an artificial draft is created by means of a hand bellows attached to the tube as shown in Fig. 1, and the manner of using the instrument will be obvious to medical men.

Dr. Tichenor may be addressed for further information at 363 Broadway, New York.



TICHENOR'S IMPROVED INHALER.

Disposition of Gas Burners.

Much of the economy and effect of gaslight, says the *Gas-Light Journal*, depends upon the arrangement of gas burners in relation to each other, to the surroundings of furniture, hight of ceilings, distance, and angles of walls, hangings, etc.

The general practice in this country and in Europe, of disposing burners in chandeliers in the center of rooms, although pleasing to the eye in its artistic effect, simply as an ornament to the room, is far from being the most philosophical manner to obtain the best effect from the light.

The diffusion of light, in its effects, is materially modified by the laws of reflection and refraction.

Light decreases in intensity in proportion to the square of the distance from the burner or point of illumination. This is a general rule, but in a room with four white walls and a ceiling, the reflection of the light upon itself, as it were, will apparently modify the rule.

Shadows have much to do in the effective and satisfactory lighting of any hall or room. Hence it is a single light, or a center piece, or nucleus of lights as represented by a chandelier, is objectionable, because your shadow will appear in any part of the room opposite to the light, and is more or less inconvenient in proportion as it differs in that respect from daylight, which is so diffused as to avoid this evil except in peculiar conditions.

Now, in view of these suggestions, is it not apparent that the proper and most efficient position for gas burners is at the different sides, or better, the different angles of a room? Then the intensity of light will be more uniform in every part of the room, no shadows will be formed, and the reflective action of the walls will be most effective. These *reflections* will show the folly of using bracket lights at one side only *of* a room; where shadows fall in every direction it is possible to move from it, and with increased intensity as you go, until the gloom of the opposite side brings you back like a moth, to be blinded by the glare of the immediate proximity of a single luminary. If brackets are to be employed, let there be at least two in a room, and these disposed *vis a vis*, or as nearly so as possible.

Reflectors.—The value of reflectors is not appreciated as it should be, and the reason is principally because few people, even those whose business is to make apparatus for artificial light and attend to the introduction of gas fixtures, etc., are sufficiently acquainted with the laws that govern reflected light, and when so, they fail in the mechanical ability to properly arrange reflectors so as to obtain the proper effect. Reflectors should be made of a material that will not tarnish by the action of the atmosphere or the temperature they may be exposed to. A very slight film of dust, moisture, or smoke on a reflector will almost entirely destroy its value as a reflector. The surface of the reflectors should be perfectly smooth and free from scratches and abrasions. Hence, it is apparent that metallic reflectors are not the best in that respect.

Glass reflectors are superior, inasmuch as they do not become tarnished, shrinked, or scratched, but their action is impaired if the glass is too thick, owing to the absorption of light. The late American invention of a mica reflector is advantageous on that account, because the plates or lamina are very thin. It has also the advantage of not being fragile or liable to fracture.

Reflectors are better placed overhead. A reflector which throws the light in a horizontal direction, unless neutralized by another opposite, will be very disagreeable, owing to the dazzling glare. As a rule, reflectors should be so placed that the reflective rays shall never reach the eye in a straight line. This will avoid the evil effects of glare. As a rule, all the direct rays of a lamp or burner thrown upward may be thrown downward by reflectors, producing a great economy of light and an effectiveness of illumination very pleasant and satisfactory.

Apple Worms.—"Carpocapsa pomonella."

Almost every one who is in the habit of eating raw apples must have repeatedly noticed the little whitish worm, which is so often found burrowing at the core of the fruit, and filling it with its disgusting excrement. But probably not one fruit-grower out of a hundred has ever seen the little moth which is produced from this worm, and which, in in its turn, gives birth to a fresh generation of such worms. In the annexed

figure, *a* shows the burrowings of this worm-like larva, *b* the point where it effects its entrance, *c* the larva itself, of the natural size when full grown, *h* the front part of its body magnified, *d* the pupa, *i* the cocoon, and *f* and *g* the perfect moth, which is distinguishable from all other moths by a patch of burnished coppery scales at the tip of its front wings. In English this moth is variously known as the apple-worm moth, or the codling-worm moth, but there is only one scientific or Latin name for it. Like most of our worst insect foes, it was originally a denizen of the Old World, having been introduced into this country only about the beginning of the present century. Twenty years ago it was unknown in Illinois; and it is only within the last eight or ten years that it has penetrated into Iowa.

The apple-worm moth makes its first appearance in North Illinois from the last of May to the forepart of June, and a little earlier or later according to the season or the latitude. Usually, at the time it appears, the young apples are already set, and beginning to be about as large as a hazel-nut. After coupling in the usual manner, the female moth then proceeds to deposit a single egg in the blossom end (*b*) of the fruit, flying from fruit to fruit until her stock of eggs (amounting to probably two or three hundred) is exhausted. Not long after accomplishing this process she dies of old age and exhaustion. In a very few cases the egg is deposited in the hollow at the stalk end of the fruit, or simply glued on to the smooth surface of its cheek. In a short time afterwards the egg, no matter where it is located, hatches out, and the young larva forthwith proceeds to burrow into the flesh of the apple, feeding as he goes, but making his head-quarters in the core. In three or four weeks time it is full grown, and shortly before this the infested apple generally falls to the ground. The larva then crawls out of the fruit through a large hole in the cheek, which it has bored several days beforehand for that express purpose (as shown in the figure), and usually makes for the trunk of the tree, up which it climbs, and spins around itself a silken cocoon of a dirty white color, in any convenient crevice it can find, the crotch of the tree being a favorite spot. Here it transforms into the pupa state; and, towards the latter end of July or the forepart of August, bursts forth in the moth state. We have noticed that a larva will occasionally spin its cocoon on the under surface of some board lying flat on the ground, instead of climbing the tree in the usual manner.

The whole of the above process is now repeated by this second generation of moths; but, the apples being now very much larger, not near so many of them fall to the ground through the internal injury inflicted by the insidious little apple-worms. A large part of them, in fact, hang on the trees till they are ready to be harvested, and in many of them the worms may still be found even up to the beginning of the winter. Those larvæ that leave the apples before they are harvested dispose of themselves in the same manner as the larvæ belonging to the first or spring brood. Those that remain in the apples until they are barreled up almost invariably make their way out in the course of the autumn, and spin their cocoons under the hoops of the barrel, or in any suitable cracks they can find in the staves. In a single apple-barrel, which we broke up in the spring for this express purpose, we once found about two hundred such cocoons. But wherever this second brood of larvæ spins its cocoon—whether on the tree, under some loose board, or under the hoops of a barrel—it always lies in its cocoon, in the larva state, all through the winter without eating anything, and never transforms into the pupa state till the beginning or middle of the following May. It is from this generation of pupæ that the early brood of moths takes its origin, which lay their eggs upon the young apples when they are about the size of hazel nuts, as already explained.

It has long been known that, by placing an old cloth, or anything of that nature, in the crotch of an apple tree, the apple-worms may be decoyed into building their cocoons underneath it, and thus be destroyed wholesale. Dr. Trimble's method—which amounts to the same thing, and has been found to be practically very beneficial—is to fasten two or three turns of a hay band round the trunk of the apple tree, and every few days, from the middle of July to the middle of September, to slip the hay band up and destroy the cocoons that have from time to time been formed on the bark underneath it.

All authors are agreed as to the practical importance of picking up and destroying the wormy apples as soon as they fall, either by hog power, or, when that is inconvenient and impracticable, by man power. When we consider that every female moth that hatches out in July or August, from the first brood of apple worms, will probably deposit an egg in some two or three hundred nearly matured apples, thereby rendering them more or less unsalable, the importance of destroying the wormy windfalls—in the forepart of the season at all events—becomes at once apparent. The larvæ that leave these early windfalls lie so short a time in the cocoon before they come out in the moth state, that there is not much chance for birds, and other insect devouring animals, to get hold of them, more particularly as insects of various other kinds are always to be met with abundantly in the summer time. But with the second brood of larvæ, which have to lie for six months in a torpid state, all through the long and dreary winter, when woodpeckers, and such other birds as do not migrate to warmer climates in the cold season, are often hard put to it for food, we are satisfied that the case is very different. From the careful inspection of several large orchards in the early spring months, we are convinced that almost all the cocoons of the apple-worm moth, that have been constructed in the autumn on the trunks and limbs of apple trees, are gutted of their living tenants by hungry birds, long before the spring opens. How then is the brood propagated in the ensuing spring? Partly, perhaps, from such few cocoons as have been placed under boards lying flat on the ground, under logs, etc., but in a great measure, down

believe, from the cocoons contained in such vast numbers, as has been already shown, in empty apple barrels. To these, situated as they generally are in cellars, or in barns or other out buildings, birds have no access, consequently, as the spring opens, the moths mature from them in great flocks, without let or hindrance, and, flying forth into the apple orchards, immediately commence their evil works. We have ourselves noticed the moth in early spring, in the windows of a house in the cellar of which a few bushels of apples had been stored through the winter. Suppose that from one such infested barrel there are generated one hundred female apple-worm moths, and that each moth, on escaping into the orchard, lays only two hundred eggs, thereby spoiling two hundred apples; it follows that twenty thousand apples, or, allowing a hundred apples to the bushel, two hundred bushels of fruit may be ruined by the product of a single old barrel, worth perhaps a quarter of a dollar!

We would, therefore, earnestly impress upon our fruit-growing readers the practical importance of examining all barrels or other vessels in which apples have been stored through the winter; and if, as will generally be the case, they are found to be swarming with apple-worm cocoons in the spring, let them be either burnt up at once, or thoroughly scalded by immersing them in boiling-hot water for a few minutes.—*American Entomologist.*

VELOCIPEDE NOTES.

An important meeting of the manufacturers of velocipedes was held in this city on Monday, the 7th inst. All parts of the country except New England were represented, and the action was unanimous. It was determined to resist all claims under the Lallemont and Smith patents, and to recognize the Hanlon patents alone. A fund for the purpose of the expected litigation will be provided by a contribution of from fifty cents to a dollar upon each machine made. A committee to take charge of the future proceedings was appointed, consisting of Messrs. T. R. Pickering, Cornelius Van Horn, and G. H. Mercer; Mr. Van Horn as Treasurer. They will at once retain suitable counsel, and prepare for the contest.

The newspapers from Amsterdam, the capital of the Netherlands, mention a new steam velocipede invented by a certain Mr. J. Loeff. It has three wheels, is compact, easily governed, runs very fast, and may be easily stopped. One has been made so as to accomodate two persons, having a steam engine of 1½-horse power, making about twenty miles an hour. Another is in course of construction, of 2-horse power, with seats for four persons.

The success of these vehicles is said to have been such that the practicability of using such velocipedes, instead of horses, to propel the boats on the Dutch canals, is under discussion. To carry out this plan, a company has already been formed.

The French papers contain the description of a peculiar velocipede invented by M. Guillermin, of which we give an extract:

It has three wheels, and is partially covered by the figure of a horse made of india rubber. In the sides of this horse is wheelwork driven by springs, made of thin steel strips, thirty yards long, which are wound up as spirals. These springs are so connected, by means of a series of cog wheels, with the wheels of the velocipede, that, when once wound up, they cause these wheels to make two thousand revolutions, and as their diameter is 3 feet, they may run more than 3 miles when once wound up.

The handle, with which to wind up, is at the side of the horse, within reach of the rider, who can turn it without stopping the machine. The india-rubber horse has its fore legs on the axis of the front wheel; serving in fact only as envelopes for covering the legs of the rider, who apparently makes no motion, but he uses his feet and hands for steering and propelling. It is expected that one may make 15 miles per hour with this machine without fatigue. The ears of the horse are handles by which the rider opens the head, in which is a box containing provisions and refreshments; while behind him, another receptacle in the horse contains his valise and other property.

It is reported that Frenchmen regard this ridiculous machine as one of the most elegant things which has yet appeared since the velocipede sensation first commenced.

Titusville, Pa.

About a mile below Titusville, the first oil-well derrick that was ever built, in this or any other country, is still to be seen. In the light which petroleum has thrown upon the world since, the history of this primitive enterprise stands out like a romance, the interest of which is hightened not a little by the fact that the man who first bored for oil, and by his pluck and perseverance, not only flooded a community with sudden riches, but increased the wealth of the world, is to-day himself a poor man.

That man is Mr. E. L. Drake, commonly called "Colonel Drake" in the oil region. He first made his appearance here in 1857. Previous to that time he had been a conductor on a railroad in Connecticut.

Before the first oil well was sunk Titusville (named after a family of Tituses) was a small backwoods village, with a population of raftsmen and lumbermen numbering about two hundred. Oil flowed from that well, and in five years Titusville became the fourth post-office town in the State. It had forty hotels, and a fixed or floating population of I know not how many thousands—speculators, shop-keepers, well-diggers, and teamsters. The army of teamsters alone numbered at one time not less than four thousand.

Very different is Titusville, to-day.—The brick blocks that sprang up in that period of excitement still remain; and I am told that it has now a permanent population of seven thousand. But comparative quiet reigns here. The forty hotels have been reduced to four or five. This change has not been brought about simply by the failure of wells in this vicinity and the continuation of the railroad down the creek. Oil enough still comes here to keep up the old excitement, if teams were any longer of use in conveying it. Teamsters supported the hotels, the shops, the smithies, and kept various branches of business alive; but the time came for a revolution in this cumbersome and costly method of transportation.

Teamsters were to be superseded. The right man stepped forward at the right moment, and spoke the word of common sense—always a danger and a menace to old routine. "Instead of all this clatter and hubbub of wagons and whips and oaths, in carrying loads of barrels over land, why not," said he, "send the oil silently flowing underground, through pipes, like so much Croton or Cochituate water?" The reform was of course opposed—as all such reforms must be at the outset—by the class whose interests were assailed. Mobs of teamsters tore up the pipes, burned the tanks, and threatened the lives of the pipe-layers. This was done repeatedly; but it was striving against fate. In 1865 the system was fairly established, in spite of all opposition, and now almost the entire product of the oil region, amounting to ten thousand barrels a day, flows or is forced through pipes, from the scattered farms, to the railroad centers, and the army of teamsters has disappeared. A great saving in transportation, in whiskey, and profanity, has been the result.—*Atlantic Monthly.*

Treatment of Scarlet Fever.

Dr. Charles T. Thompson reports in the *Lancet* his manner of treatment in scarlet fever as follows: The patient is immersed in a warm bath in the early stage of the disease, and this is repeated frequently, or as often as the strength of the patient will allow. The first effect is to produce a soothing and refreshing feeling in the patient, to be followed soon by such an eruption on the surface, of so vivid a color, and in such amount as would astonish those who have never witnessed it. Thus one of the greatest dangers of this fearful disease—the suppression of the eruption—is escaped.

The appetite generally returns after the first or second bath, and the strength of the patient is kept up by nutritious food. The bath prevents the dissemination of the disease, by removing the excreta from the skin as soon as it is deposited. This treatment promotes cuticular desquamation. The body should be gently dried by soft linen cloths after the bath.

By this procedure the various secretions are deprived of their noxious properties, and the irritation of internal organs is quickly relieved, thus dissipating infection. Another benefit is that a very serious case is soon reduced to a mild one, and the patient recovers in less than half the usual time. Since Dr. Thompson has pursued this practice—during the last fifteen years—he has never lost a patient from scarlet fever.

Correspondence.

The Editors are no responsible for the Opinions expressed by their Correspondents.

Crank vs. Pulley.

MESSRS. EDITORS:—The subject of the crank and pulley have at various times received attention in the columns of your journal, and always to the disadvantage of the pulley. Not I think because of the intrinsic advantage of the crank over the pulley, but from the manner in which the subject has been presented by the advocates of the pulley. These advocates have always laid their great stress on the pulley by the advantage in leverage, which they affirm it has over the crank, while every mechanician will see at once that they are mistaken; but instead of meeting the crankites with argument and facts to sustain their side of the question, they call hard names and endeavor to ridicule the crankites out of their true position. Now while I am not certain that I am right, not because I am not positive in the correctness of my position, but because I find no one who agrees with me on the subject, I will, with your permission, endeavor to show wherein the crank loses power in its operation, and wherein it would be saved by the pulley, or some other device, could one be found that would work as practically as the crank.

In the first place, there is a difference in the travel of the piston from the center of the cylinder, to the ends of the cylinder, according to the length of the pitman; with a short pitman more and with a long pitman less. When the piston is at the outer end of the cylinder and moving in toward the crank at half stroke, the crank has not made a quarter revolution; and when it travels the other half of the stroke, or comes to the other end of the cylinder, it makes just as much more of the quarter revolution as it fell short of in the first half of the stroke; and when it turns the corner and returns, the first half of the stroke makes more than a quarter of a revolution, and the last half of a stroke less than a quarter revolution; so that there is a constant antagonism between the travel of the piston in the first and last half of the stroke; and not uniform either, for the first half of the outgoing stroke is the longest, and the first half of the ingoing stroke is the shortest. Now this being the case, just as much steam is used in one end of the cylinder as the other; either the piston must make unequal time in its travel, or the crank and fly wheel must make unequal time in its motion—and there is a constant antagonism between them, and it seems to me an effort of power to keep up an equilibrium. But it may be said, which is true, there is just an equal amount of leverage, in the two halves of the stroke, and consequently, an equal amount of power exerted, on the crank, the whole stroke. That is all true, but it does not help the matter any, it does not change the time taken to pass through, or over a given space, for the leverage on the short travel of the crank being just the same as that on the long travel, it has a tendency to make the crank travel faster over the short part of the stroke than it does over the long, while the requirement to keep up steady and uniform travel of the crank and fly wheel, would require the quickest amount of travel over the long part of the stroke. And that is the reason in my opinion, why a large and heavy fly wheel, is required for an engine. It is to give regularity of motion and not to pass the centers.

Milwaukee, Wis. J. B. SMITH.

How to Get Patents Extended.

Official List of Patents.

Issued by the United States Patent Office,

FOR THE WEEK ENDING JUNE 8, 1869.

Reported Officially for the Scientific American

SCHEDULE OF PATENT OFFICE FEES:

On each caveat	$10
On filing each application for a Patent (seventeen years)	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On an application for Design (three and a half years)	$10
On an application for Design (seven years)	$15
On an application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

90,911.—SEED PLANTER.—Moses Adams, Chilmark, Mass.
90,912.—STOVEPIPE DAMPER.—Thos. K. Anderson, Hornellsville, N. Y.
90,913.—SASH LOCK.—H. G. Arnold, Rochester, N. Y.
90,914.—CONVEYER TO TRANSFER BLANKS FROM A PUNCHING PRESS.—J. H. Baird, Oakville, Conn.
90,915.—THREE-HORSE EQUALIZER.—F. E. Barr, Albion, assignor to himself and J. J. Barr, Elba, N. Y.
90,916.—MEASURING CAN FOR LIQUIDS.—Wm. Barry, Carthage, N. Y.
90,917.—MODE OF FORMING THE CONNECTIONS OF GAS PURIFIERS.—Robert Briggs, Philadelphia, Pa.
90,918.—CENTER VALVE OF GAS WORKS.—Robert Briggs and Peter Muntzinger, Philadelphia, Pa.
90,919.—ATTACHING AUGERS TO HANDLES.—Elisha Broad, St. Anthony, Minn. Antedated June 3, 1869.
90,920.—CORSET SKIRT SUPPORTER.—J. W. Brooks, Boston, Mass.
90,921.—MACHINE FOR PLOWING AND BREAKING UP GROUND.—John Bryan, Lebanon, Ill.
90,922.—CORD-TIGHTENER FOR CURTAIN FIXTURES.—Albert Carter (assignor to himself and G. K. Ryan), New York city.
90,923.—BOSOM PAD.—Benj. Carter, Middletown, Conn.
90,924.—FURNACE FOR THE MANUFACTURE OF IRON AND STEEL.—T. J. Chubb, Williamsburgh, N. Y.
90,925.—MODE OF MAKING CAST-STEEL CASTINGS.—Thos. J. Chubb, Williamsburgh, N. Y.
90,926.—PROCESS OF MAKING CAST STEEL.—T. J. Chubb, Williamsburgh, N. Y.
90,927.—PROCESS OF MELTING AND REFINING IRON FOR MALLEABLE IRON CASTINGS.—T. J. Chubb, Williamsburgh, N. Y.
90,928.—MAKING BLOOMS OF STEEL AND WROUGHT IRON.—T. J. Chubb, Williamsburgh, N. Y.
90,929.—BRICK AND TILE KILN.—S. H. Clapp, Malden, Mass.
90,930.—STEAM-OPERATED WATER EJECTOR.—Hugh Coll, Millville Borough, Pa.
90,931.—MACHINERY FOR CUTTING CARDS.—Edwin Cowles, Cleveland, Ohio.
90,932.—GRAIN SEPARATOR AND MIXER.—J. J. Crowley, San Francisco, Cal.
90,933.—ROLLING APPARATUS.—E. M. Davis (assignor to G. R. Dawson), Pittsburgh, Pa.
90,934.—DRAFT REGULATOR FOR HEATING APPARATUS.—Royal E. Deane, Brooklyn, N. Y.
90,935.—COUPLING FOR PUMP RODS.—I. A. Dewar, D. S. Smith, and R. A. Brashear, Franklin, Pa.
90,936.—FANNING MILL.—E. P. Dickey, Racine, Wis.
90,937.—HANGER FOR SHAFTING.—James Duff (assignor to himself and E. B. Pierce), Peoria, Ill.
90,938.—TUG HOOK.—John Eck, Medora, Ind.
90,939.—HARROW.—Joseph Foltz, Valley Mills, Ind.
90,940.—PUMP.—I. N. Forrester, Bridgeport, Conn.
90,941.—BEDSTEAD, SEAT, ETC.—C. T. Frost, Medfield, Mass.
90,942.—WASH BOILER.—G. M. Granger, Memphis, Miss.
90,943.—PINKING MACHINE.—F. L. Hagadorn, Baltimore, Md.
90,944.—PROCESS OF PRESERVING MEAT, FOWL, FISH, ETC.—Charles Havard and M. X. Harmony, London, England.
90,945.—KEY FASTENER.—J. E. Hills, Orange, Mass.
90,946.—MACHINE FOR SCUTCHING AND THRASHING FLAX.—Moses Jerome, Dixon, Ill.
90,947.—VELOCIPEDE.—E. A. Jones, Sturgis, Mich.
90,948.—STUD.—J. G. Kenyon, Providence, R. I.
90,949.—LIGHTNING ROD.—T. T. Kinsey, deceased, Philadelphia, Pa. (M. H. Kinsey and James Gilkyson, administrators).
90,950.—CORSET.—H. E. Marchaud (assignor to R. E. Cross), Louisville, Ky.
90,951.—METALLIC CARTRIDGE.—J. V. Meigs, Washington, D. C.
90,952.—SHIFTING CLEATS, OR RING BOLTS, ETC.—J. E. Murray, Provincetown, assignor to himself, Z. D. Rich, Somerville, and Jos. Hall, Cambridge, Mass.
90,953.—SEEDER AND FERTILIZER.—J. J. Naylor, Brighton, Mich.
90,954.—SEWING MACHINE.—James Neale and Peter Beck, Bridgeport, Conn.
90,955.—PROCESS OF COLLECTING GOLD AND SILVER FROM ORES.—A. F. W. Partz, Oakland, Cal.
90,956.—RING FOR SPINNING MACHINE.—H. L. Peirce, Taunton, Mass.
90,957.—FIRE-PLACE HEATER.—D. S. Quimby, Jr., (assignor to D. S. Quimby), Brooklyn, N. Y.
90,958.—STEP AND BEARING FOR VERTICAL SHAFTS.—George Richardson, Lowell, Mass.
90,959.—DEVICE FOR TURNING SAW LOGS.—Warren Richardson, Colfax, Cal.
90,960.—MITER BOX.—Ezekiel Root, Parma, Mich.
90,961.—COMBINED LAND ROLLER, MARKER, AND HARROW.—Roger Sandiford, Joliet, Ill.
90,962.—MEDICAL COMPOUND.—Oscar Scidmore, Albany, N. Y.
90,963.—MINER'S LAMP.—William Seybold (assignor to himself and S. H. Hoffman), McKeesport, Pa.
90,964.—SNAP HOOK.—W. W. Sly, South Haven, Mich.
90,965.—BUGGY-TOP BOW SETTER.—Obediah Smith (assignor to himself, M. T. Gyder, and W. H. Rosser), Bloomington, Ill.
90,966.—IRONING TABLE.—Henry Soggs, Columbus, Pa.
90,967.—MINER'S LAMP.—J. S. Sommerville, Snow Shoe, Pa.
90,968.—CARRIAGE AXLE.—Thomas Spurrier, Sharon, Pa.
90,969.—STONE SAWING MACHINE.—T. H. Stevens, Dover, N. Y.

90,970.—Hay and Cotton Press.—Enoch Thomas, Craigsville, Va.

90,971.—Farm Gate.—C. W. Todd, Spring Arbor, Mich.

90,972.—Saw Filing Machine.—William Tucker, Philadelphia, assignor to himself and F. A. Snell, Pittsburg, Pa.

90,973.—Step Ladder.—C. G. Udell, Chicago, Ill.

90,974.—Shoulder Brace.—G. W. Walker, Lowell, Mass.

90,975.—Fire Escape Ladder.—Carl Weidling, New York city.

90,976.—Ventilator.—Henry White (assignor to himself and W. F. Whitehouse), Chicago, Ill.

90,977.—Railway Car Coupling.—O. D. Woodruff, Southington, Conn.

90,978.—Grinding Mill.—Henry Albright, Cranesville, West Va.

90,979.—Clothes Rack.—James Alcorn (assignor to J. N. Melvin for one third, and Thomas Quinn for one third), Charlestown, Mass.

90,980.—Harrow.—A. W. Ball, Delaware Grove, Pa.

90,981.—Grain Separator.—Stephen Ballard, Sr., Sullivan, Ind.

90,982.—Friction Clutch and Brake.—Darius Banks, Jr., New York city.

90,983.—Stove Cover.—O. B. Bartlett, Lewiston, Me.

90,984.—Beehive.—J. H. Bassler, Pine Grove, Pa.

90,985.—Baby Jumper.—William Berg and Mathias Stephan, Canton, Ohio.

90,986.—Stall Floor.—W. M. Bleakley, Verplanck, N. Y.

90,987.—Soldering Furnace.—J. G. Borden and Walter Power, Brewster Station, N. Y.

90,988.—Combined Steam and Vacuum Gage.—Charles Bourgeois, Buffalo, N. Y.

90,989.—Coupling for Whiffletrees.—D. J. Brady, Greenwich township, Ohio.

90,990.—Spring Saddle-Tree.—J. R. Bragg, Williamsburg, Mo.

90,991.—Fork for Hay Spreaders.—G. E. Burt and E. A. Hildreth, Harvard, Mass.

90,992.—Friction Clutch.—C. W. Cardot, Jamestown, N.Y.

90,993.—Carriage Wheel.—C. F. Carman, Hamburg, Iowa.

90,994.—Meat Chopper.—Paul Clareton, New York city.

90,995.—Teapot Handle.—L. C. Clark, Plantsville, Conn.

90,996.—Let-Off Mechanism for Looms.—Wm. R. Clark, North Adams, Mass.

90,997.—Pocketbook.—S. C. Currie, New York city.

90,998.—Cord Holder for Picture Frames, etc.—R. d'Heureuse, New York city.

90,999.—Bed Bottom.—Samuel Dunlap, Rome, Ga.

91,000.—Lubricating Cushion for Railway Car Journals.—P. S. Devlan, Jersey City, N. J., assignor to himself and W. H. Jewell, New York city.

91,001.—Hay Spreader.—W. H. Elliot, New York, assignor of one half to M. D. Myers, Frankfort, N. Y.

91,002.—Seed Planter.—F. E. A. Engelman, Cheektowaga, N. Y.

91,003.—Corn Sheller.—F. Fanning, Atchison, Kansas.

91,004.—Bag Holder.—E. A. Fisher, Morganville, N. Y.

91,005.—Corn Harvester.—Amander Ford, Toledo, Ohio.

91,006.—Weather Strip.—E. P. Ford, Shipman, Ill.

91,007.—Packing in Cylinders for Drying Paper.—W. D. Fowler, Lawrence, Mass.

91,008.—Manufacture of Cores.—Samuel Fulton, Conshohocken, Pa.

91,009.—Nut and Coffee Roaster.—D. A. T. Gale, Poughkeepsie, N. Y.

91,010.—Steam Engine Piston Packing.—John Gates, Portland, Oregon.

91,011.—Knife Scourer.—S. R. Goodsell and J. Q. Adams, Brooklyn, N. Y.

91,012.—Toilet and Nursery Table.—Henry Havekorst, Leavenworth City, Kansas.

91,013.—Feed Box.—Joseph Hawse, Wolcott, Vt.

91,014.—Gun Lock.—R. D. Hay and J. M. Hill, Crooked Creek, N. C.

91,015.—Center Bearing for Locomotives.—B. W. Healey, Providence, R. I.

91,016.—Churn.—Eaton Hitchcock, Sturbridge, Mass.

91,017.—Water Wheel.—J. B. Holmes, Lawrence, Kansas.

91,018.—Velocipede.—W. F. Holske and B. T. Babbitt, New York city.

91,019.—Bell Lever Box.—B. W. Hopper, Astoria, N. Y.

91,020.—Shade for Gas and Lamp Burners.—John Horton, New York city.

91,021.—Refrigerator.—David Howarth, Portland, Me.

91,022.—Apparatus for Parlor Games.—Chas. N. Hoyt, Providence, R. I.

91,023.—Water Elevator.—David Jones, Machen, Newport, Wales.

91,024.—Harrow.—S. G. Jones, Niantic, Ill.

91,025.—Machine for Making Paper Boxes.—J. M. D. Keating and T. Y. Waymouth, New York city.

91,026.—Shutter Worker.—Daniel Kidder, Franklin, N. H.

91,027.—Rake.—J. C. Klein, Birmingham, Pa.

91,028.—Car Coupling.—Charles Layton, Matawan, N. J.

91,029.—Violin.—Jacob Lenhard, New York city.

91,030.—Mosquito Net Support.—B. M. Leroy and Albert Strasser, Montgomery, Ala.

91,031.—Cultivator Plow.—A. J. Lewis, Pittsburgh, Pa.

91,032.—Fly Frame.—J. G. Luscomb, Taunton, Mass.

91,033.—Ironing Board.—Andrew Matson, Elizabeth, N. J.

91,034.—Cotton Bale Tie.—G. B. McDonald, Louisville, Ky.

91,035.—Velocipede.—J. W. McMillan, Greenville, Ala.

91,036.—Potato Digger.—F. A. Morley, Syracuse, N. Y.

91,037.—Combined Horse Hay Rake and Hay Spreader.—F. E. Nearing, Brookfield, assignor to himself and Wm. H. Hubbell, Danbury, Conn.

91,038.—Black Pigment from Mineral Carbon.—Philip O'Reilly, Hartford, Conn.

91,039.—Step Ladder.—W. G. Philips, Newport, Del.

91,040.—Tool for Trimming Bolt Heads.—A. P. Plant, Plantsville, Conn.

91,041.—Brick and Sand Dryer.—S. D. Rader, Williamsport, Pa.

91,042.—Anchor for Animals.—P. H. Raiford, Houston, Texas.

91,043.—Fastening for Fireproof Shutters.—Thomas Reese and W. L. Reese, St. Louis, Mo.

91,044.—Nail Clencher for Horseshoes.—Nicholas Repp, Waterloo, Iowa.

91,045.—Operating Ships' Pumps.—Almon Roff, Southport, Conn.

91,046.—Vegetable Gatherer.—J. Schermerhorn, Daysville, N. Y.

91,047.—Tool for Splitting Whalebone.—Jas. A. Sevey, Boston, Mass.

91,048.—Mechanical Movement.—Henry Shutts, Oregon, Mo.

91,049.—Stump Extractor.—William Smith, Pine Hill, Wis.

91,050.—Mechanism for Stopping the Loom when a Warp Breaks.—J. J. Switzer, Chelsea, assignor to himself and E. B. Fitts, Northborough, Mass.

91,051.—Furnace for Extracting Zinc from its Ores.—Aloys Thoma (assignor to the American Zinc Company), New York city.

91,052.—Zinc Furnace.—A. Thoma (assignor to the American Zinc Company), New York city.

91,053.—Sad-Iron Heater.—P. W. Thomas, Waterbury, Vt.

91,054.—Dough Kneader.—Friend Thrall (assignor to himself and A. B. Thrall), Oshkosh, Wis.

91,055.—Machine for Double-Seaming Sheet Metal.—Archibald Trolan, Norwich, Conn.

91,056.—Pen.—J. W. Truman, Macon, Ga.

91,057.—Baling Short-Cut Hay and Straw.—S. W. Adwen, Rochester, N. Y.

91,058.—Cartridge Case Cleaner.—F. B. Aiken, Franklin, N. H.

91,059.—Fire Place.—T. C. Aldridge, St. Louis, Mo.

91,060.—Valve Gear.—A. M. Allen, New York city.

91,061.—Velocipede.—A. M. Allen, New York city.

91,062.—Velocipede Saddle.—Geo. B. Ambler, Bridgeport, Conn.

91,063.—Hatchway for Buildings.—Israel Amies, Philadelphia, Pa.

91,064.—Tool Handle.—E. J. Amor (assignor to himself and H. E. Dency), New York city.

91,065.—Vise.—A. G. Andren, Gottenburg, Sweden.

91,066.—Gas Works for Making Coal Gas.—Avery Babbett and W. W. Binney, Auburn, N. Y.

91,067.—Grain Separator.—C. F. Babcock, Chicago, Ill.

91,068.—Vise.—Q. S. Backus, Winchendon, Mass.

91,069.—Combined Steam Generator and Stove.—L. F. Bancroft, Worcester, Mass.

91,070.—Polishing and Cleansing Powder.—J. W. Bates, St. Paul, Minn.

91,071.—Shield for Tunneling.—A. Ely Beach, Stratford, Conn.

91,072.—Ratchet Feed.—A. B. Bean, New Haven, Conn.

91,073.—Stove Drum.—H. F. Blemker, Evansville, Ind.

91,074.—Machine for Turning Wagon Axles.—Albert Booth, Springfield, Ill.

91,075.—Mail-Bag.—Fred. C. Borst and Philander Wonsey, Spencerport, N. Y.

91,076.—Cooking Stove.—G. S. Bosworth, Troy, N. Y.

91,077.—Cutting Hat-Tips.—T. W. Bracher, New York city. Antedated May 28, 1869.

91,078.—Horse Hay-Fork.—Joseph Bradley, Racine, Wis.

91,079.—Device for Operating Throttle-Valves.—H. L. Brevoort, Brooklyn, N. Y.

91,080.—Fastening for Top-Masts and Top-Gallant Masts.—Leverett Brown, New York city.

91,081.—Manufacture of Bracelets.—Geo. Burch, Newark, N. J.

91,082.—Machine for Milling the Body of Keys.—Francis Caffrey and J. L. Nettleton, West Cheshire, Conn.

91,083.—Securing Buttons to Fabrics.—Geo. J. Capewell, West Cheshire, Conn., assignor to "Porter Brothers," New York city.

91,084.—Cultivator.—D. F. Carr, East Union township, Ohio.

91,085.—Machine for Disintegrating Fertilizers and other Articles of Manufacture.—Thos. Carr, Bristol, Great Britain. Patented in England, Oct. 3, 1864.

91,086.—Furniture Caster.—Stephen Chandler, New York city.

91,087.—Harness.—S. G. Cheever, Boston, Mass.

91,088.—Sash Balance.—Peter Christiansen, Rochester, Minn.

91,089.—Hair-Dyeing Brush.—W. B. Coates (assignor to Edwin Clinton and W. H. Eisenbrey, for three fourths of the invention), Philadelphia, Pa.

91,090.—Composition Crayon.—William Compton, New York city.

91,091.—Cotton Bale Tie.—Jos. Crookes (assignor to himself and J. W. Branch), St. Louis, Mo.

91,092.—Device to Prevent Injury to Liquor on Tap.—J. G. Cullmann, Cincinnati, Ohio.

91,093.—Apparatus for Raising and Dumpimg Coal.—Jos. Delaney, Ashland, Pa.

91,094.—Composition for Destroying Ants.—J. D. Dennis, Gilroy, Cal.

91,095.—Clothes Mangle.—F. A. Desloge, St. Louis, Mo.

91,096.—Paper Box.—H. A. Devendorf, Port Jackson, N. Y.

91,097.—Combined Saw-Set, Gummer, Punch, and Wire-Cutter.—J. L. Devol, Parkersburg, West Va.

91,098.—Peanut Oven.—Dexter Dill, New Haven, Conn.

91,099.—Extension Table.—Jacob Dourson, Columbus, Ohio.

91,100.—Process for Reducing the Size of Plaster Molds.—Nancy A. Downer, Canandaigua, assignor to herself and David C. Chase, Clayton, Mich.

91,101.—Sewing Machine for Sewing Turned Shoes.—Wm. Duchesnin (assignor to Geo. R. Bigelow, trustee), Boston, Mass.

91,102.—Harvester-Cutter.—G. L. Du Laney, Mechanicsburg, Pa.

91,103.—Steam-Generator Smoke-Stack.—W. W. Dungan (assignor to Mary D. Dungan), Baltimore, Md.

91,104.—Tea and Coffee-Pot.—John E. Earle, New Haven, Conn.

91,105.—Street Car.—Zebina Eastman, Chicago, Ill.

91,106.—Corn Planter.—J. H. Ernest, Millerstown, Pa.

91,107.—Traveling-Bag Frame.—F. Fischbeck, Chicago, Ill.

91,108.—Postage Stamp, etc.—Addison C. Fletcher, New York city.

91,109.—Plow.—F. M. Franklin (assignor to himself and E. M. Doty), Springfield, Ohio. Antedated May 24, 1869.

91,110.—Machine for Cleaning Oats.—Wm. D. Freeman, Tomales, Cal.

91,111.—Carpet Fastener.—S. N. French, Fitchburg, Mass.

91,112.—Corset Fastening.—Maggie E. Frentz, New Albany, Ind.

91,113.—Glove.—Sigmond Gage, Brooklyn, N. Y.

91,114.—Compound for Making Friction Matches.—O. C. Green, Copenhagen, Denmark.

91,115.—Axle-Box Cover.—Fred. Grinnell, Meadville, Pa., assignor to N. C. Miller and S. R. Dummer, New York city. Antedated Dec. 8, 1868.

91,116.—Guard for Door Knobs.—W. W. Guild, Walpole, N. H., administrator of the estate of J. W. Mellish, deceased.

91,117.—Machine for Threading Screws.—N. B. Hadley, Providence, R. I.

91,118.—Sectional Mold for Glass-Ware.—R. D. Haines, Cambridge, assignor to the "Boston Silver Glass Company," Boston, Mass.

91,119.—Solid Glass-Ware Mold.—Robert D. Haines, Cambridge, assignor to the "Boston Silver-Glass Company," Boston, Mass.

91,120.—Steam Packing.—A. H. Hall and H. T. Lee, Marysville, Cal.

91,121.—Sawing Machine.—E. R. Hall (assignor to himself Wm. H. Town, and C. E. Candee) Syracuse, N. Y.

91,122.—Elastic Heel Guard for Horses.—Wm. H. Hall, New Gloucester, Me., assignor to [illegible], Mass.

91,123.—Homomotive.—William Smith Hall, Quincy, Mass.

91,124.—Iron Truss Bridge.—Geo. Halstead, Buffalo, N. Y.

91,125.—Manufacture of Wrought-Iron Columns.—Geo. Halstead, Buffalo, N. Y.

91,126.—Current Changing Apparatus.—C. C. Hare, Kansas City, Mo.

91,127.—Harness.—John K. Harris, Springfield, Ohio.

91,128.—Separator for Meal, etc.—Wm. Hawkins (assignor to himself, and F. W. Barnhart), Brooklyn, N. Y.

91,129.—Plow.—Jacob Heckendorn, Reading, Pa.

91,130.—Lamp Shade.—A. B. Hendryx, Ansonia, Conn.

91,131.—Animal Trap.—J. Herr, Carbondale, Ill.

91,132.—Glass-Ware Press.—C. H. Hersey and W. E. Hawes (assignors to themselves, and F. C. Hersey), Boston, Mass.

91,133.—Paper for Roofing.—James Howard, West Manchester, Pa.

91,134.—Regulator for Vulcanizing Apparatus.—G. H. Hurd, Memphis, Tenn.

91,135.—Chandelier.—Charles F. Jacobsen, New York city.

91,136.—Machine for Cutting Down Heels of Boots and Shoes.—J. L. Joyce, New Haven, Conn.

91,137.—Tweer.—Jos. Kay, New Haven, Conn.

91,138.—Machine for Polishing Shirt Bosoms.—J. J. Kenna, San Francisco, Cal.

91,139.—Permutation Lock.—L. W. Langdon, Northampton, assignor to himself and J. G. Clark, Springfield, Mass.

91,140.—Car Coupling.—A. Z. Long (assignor to himself and W. G. Dowd, Scranton, Pa.

91,141.—Lamp Burner.—J. C. Love, Philadelphia, Pa.

91,142.—Hardening Steel.—Obadiah Marland, Boston, Mass.

91,143.—Seed Planter.—E. G. Matthews, Newton, assignor to F. F. Holbrook, Dorchester, Mass.

91,144.—Hand Cultivator.—E. G. Matthews, Newton, Mass.

91,145.—Sweeping Machine.—I. W. McGaffey, Chicago, Ill.

91,146.—Swivel Cock Eye.—R. A. McKanna, Young America, Ill.

91,147.—Hay Loader.—A. J. McKee and S. D. McKee, Beaver Dam, Ohio.

91,148.—Car Heater and Ventilator.—Wm. S. McNeil, Springfield, Mass., assignor to American Car-Heating Company, New York city.

91,149.—Sewing Machine.—Stephen W. Miller, Dundee, N. Y.

91,150.—Tool for Cutting Glass.—S. G. Monce, Bristol, Conn.

91,151.—Pump.—James A. Morrell, New York city.

91,152.—Sirup Cock.—Andrew J. Morse, Boston, Mass.

91,153.—Neck-tie Retainer.—Porter C. Moulton, New Haven, Conn.

91,154.—Attaching Handles to Picks.—Thomas H. Neal, Allegheny Pa.

91,155.—Stone-cutting and Dressing Saw.—Isaac E. Newton, Waterbury, Conn.

91,156.—Fan.—O. R. Nitsch, New York city.

91,157.—Plow.—Wm. O'Neill, Pine Level, Ala. Antedated May 28, 1869.

91,158.—Wood Pavement.—Joseph F. Paul, Boston, Mass.

91,159.—Lifting Device for Drop Presses and Hammers.—Charles Peck, New Haven, Conn.

91,160.—Horse Hay Fork.—George C. Perry, Ortonville, Mich.

91,161.—Combined Seeder and Cultivator.—O. M. Pond, Independence, Iowa.

91,162.—Boot Crimper.—Josiah M. Read, Boston, Mass.

91,163.—Door Pulley.—John Reiser, Trenton, N. J.

91,164.—Shovel Plow.—Sanford Riley, Northcutt's Store, Ky.

91,165.—Machine for Making Horseshoes.—William D. Rinehart, Pittsburgh, Pa.

91,166.—Attaching Pen Racks to Inkstands.—C. A. Roberts, West Meriden, Conn. Antedated May 27, 1869.

91,167.—Gate Hinge.—Ira J. Ryerson, Pierceton, Ind.

91,168.—Dinner Pail.—Moritz Saulson, Troy, N. Y.

91,169.—Velocipede.—Friedrich Schmitt, Springfield, Ill.

91,170.—Coffee Boiler.—C. H. Scholle, Cincinnati, Ohio.

91,171.—Bolt-heading Machine.—Francis Schweizer, Greenpoint, N. Y.

91,172.—Harvester.—John F. Seiberling, Akron, Ohio.

91,173.—Steam Generator.—E. B. Sintzenic'; Rochester, N. Y.

91,174.—Knob Latch.—Thomas Slaight, Newark, N. J.

91,175.—Machinery for Sewing Books.—David McConnell Smyth, Orange, N. J., assignor to Henry G. Thompson, New York city, and Daniel Martin, Orange, N. J.

91,176.—Method of Preparing Beef, etc.—Benj. F. Stephens, Brooklyn, N. Y.

91,177.—Combined Seeder and Sower.—Orrin Stone, Ionia, Mich.

91,178.—Machine for Welding and Cutting Railroad Rails.—Joseph Stone (assignor to himself, C. S. Baum, M. T. Conro, E. W. Reynolds, and G. T. Thomas), Keeseville, N. Y.

91,179.—Carpet Stretcher.—Thomas B. Stout, Keyport, N. J.

91,180.—Door Bolt.—Levi B. Swartz and James M. Opdycke, Lambertville, Pa.

91,181.—Railway Car Brake.—Benjamin Tatham and Joseph Steger, New York city.

91,182.—Potato Digger.—DeWitt C. Thomas, Easton, N. Y.

91,183.—Yoke.—J. L. W. Townsend, Mount Blanco, Ohio.

91,184.—Door Spring.—John L. Tucker, Laconia, N. H.

91,185.—Sawing Machine.—William P. Uhlinger, Philadelphia, Pa.

91,186.—Coal Stove.—R. B. Varden, Uniontown, Md.

91,187.—Rocker for Chairs and Cradles.—Charles Wetterhan, Fond Du Lac, Wis.

91,188.—Lock Nut.—R. White, Mechanicsburg, Pa.

91,189.—Hat.—David Wilcox (assignor to himself, W. H. Slocum, and W. A. Brown), Boston, Mass.

91,190.—Fireplace.—Alfred Wilkin, Lucas county, Ohio.

91,191.—Printing Press.—J. K. Wright, Philadelphia, Pa.

91,192.—Lantern.—Henry C. Yerby, Leslie, Mich.

91,193.—Elevator.—James Yost, White Deer township, Pa.

91,194.—Car Coupling.—J. C. Young, Bloomington, Ind.

91,195.—Lamp.—Charles Zaiser, Newark, N. J.

91,196.—Propelling Apparatus.—Anthony Zink, Lancaster, Ohio.

REISSUES.

33,085.—Machine for Thrashing and Separating Grain.—Dated April 16, 1861; reissue 3,486.—Cornelius Aultman, Mansfield, Ohio, assignee, by mesne assignments, of Cyrus Roberts.

48,214.—Caster for Trunks.—Dated June 13, 1865; reissue 3,487.—John A. Lieb, Newark, N. J., for himself, and assignee of John Schamadel.

82,858.—Plow.—Dated October 6, 1868; reissue 3,488.—Daniel Mater, Bellmore, Ind.

18,661.—Machine for Turning Pillars for Clock Movements.—Dated November 17, 1857; reissue 3,489.—W. R. Nettleton, Bristol, Conn., assignee of Wilford H. Nettleton, Charles Raymond, and Anson Hubbell.

46,025.—Combined Cultivator and Harrow.—Dated January 24, 1865; reissue 3,490.—Edmund D. Reynolds and O. Bradford Reynolds, North Bridgewater, Mass.

65,141.—Tuck-creasing Attachment for Sewing Machine.—Dated May 28, 1867; reissue 3,491.—Anna Weissenborn, New York city.

50,351.—Suspender.—Dated October 10, 1865; reissue 3,492.—Benjamin J. Greely, Boston, Mass.

11,249.—Harvester.—Dated July 11, 1854; extended seven years; reissue 3,493.—Division A.—J. R. Myers, Philadelphia, Pa., assignee of Collins B. Brown.

11,249.—Harvest Rake.—Dated July 11, 1854; extended seven years; reissue 3,494.—Division B.—J. R. Myers, Philadelphia, Pa., assignee of Collins B. Brown.

46,488.—Harvester.—Dated February 21, 1865; reissue No. 3,495.—Division A.—Frederick Nishwitz, Brooklyn, N. Y.

46,488.—Harvester.—Dated February 21, 1865; reissue 3,496.—Division B.—Frederick Nishwitz, Brooklyn, N. Y.

46,488.—Harvester.—Dated February 21, 1865; reissue 3,497.—Division C.—Frederick Nishwitz, Brooklyn, N. Y.

61,867.—Regulator for Time Pieces.—Dated February 5, 1867; reissue 3,498.—George P. Reed, Boston, Mass.

71,418.—Telegraph Insulator.—Dated November 26, 1867; reissue 3,499.—W. Edgar Simonds, Hartford, Conn.

12,568.—Printing Press.—Dated March 20, 1855; reissue 3,500.—Lemuel T. Wells, St. Louis, Mo.

58,098.—Machine for Granulating and Drying Sugar.—Dated September 18, 1866; reissue 3,501.—Jesse Hanford, Lexington, Mass.

DESIGNS.

3,532.—Cook Stove.—Daniel E. Conklin (assignor to Barbeck, Conklin, and Willis), Baltimore, Md.

3,533.—Hinge.—William German (assignor to the Russell and Erwin Manufacturing Company), New Britain, Conn.

3,534.—Face-plate of a Hinge.—Emery Parker (assignor to the Russell and Erwin Manufacturing Company), New Britain, Conn.

3,535.—Velocipede Frame.—S. F. Pratt, Boston, Mass.

3,536.—Clock Case.—Solomon C. Spring (assignor to "Welch, Spring & Co."), Bristol, Conn.

EXTENSIONS.

Water Wheel.—John Tyler, West Lebanon, N. H.—Letters Patent No. 12,927, dated May 22, 1855.

Grooving Moldings.—Rebecca A. Marcher, New York city, executrix of Robert I. Marcher, deceased. Letters Patent of No. 12,936, dated May 22, 1855.

Machine for Making Paper Bags.—E. W. Goodale, Clinton, Iowa.—Letters Patent No. 12,945, dated May 29, 1855; reissue No. 1,035, dated September 4, 1860.

Machine for Pegging Boots and Shoes.—An act for the relief of Alpheus C. Gallahue, New York city.—Letters Patent No. 9,917, dated August 16, 1853; antedated February 16, 1853.

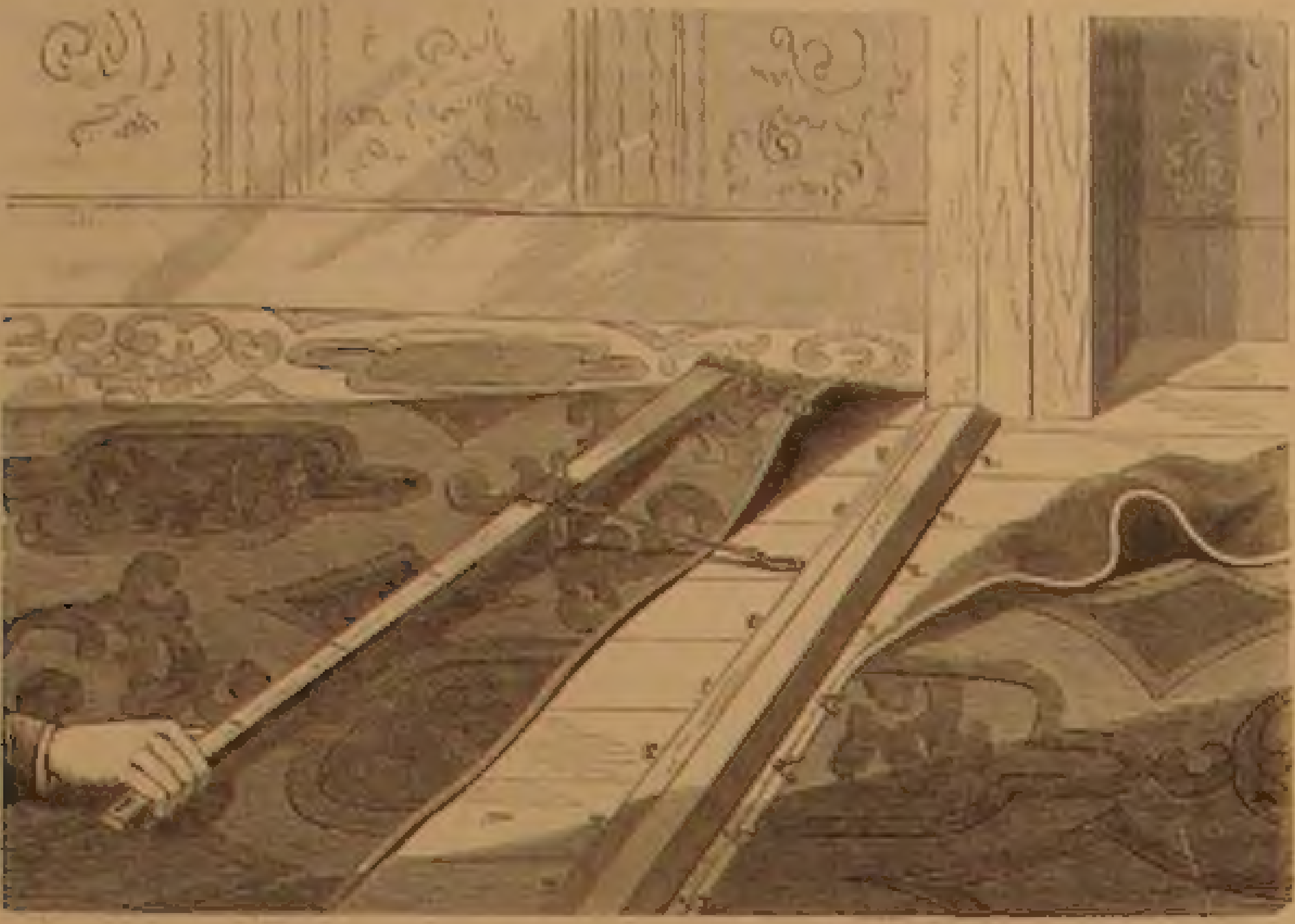
Improved Carpet Fastener and Stretcher.

One of the most trying tasks to tidy housekeepers, is that of putting down carpets. It is not merely the labor required, though that is very severe, but to get a carpet uniformly stretched, so that the figures shall not be distorted, was, by the old method, a difficult if not a wholly impossible attainment.

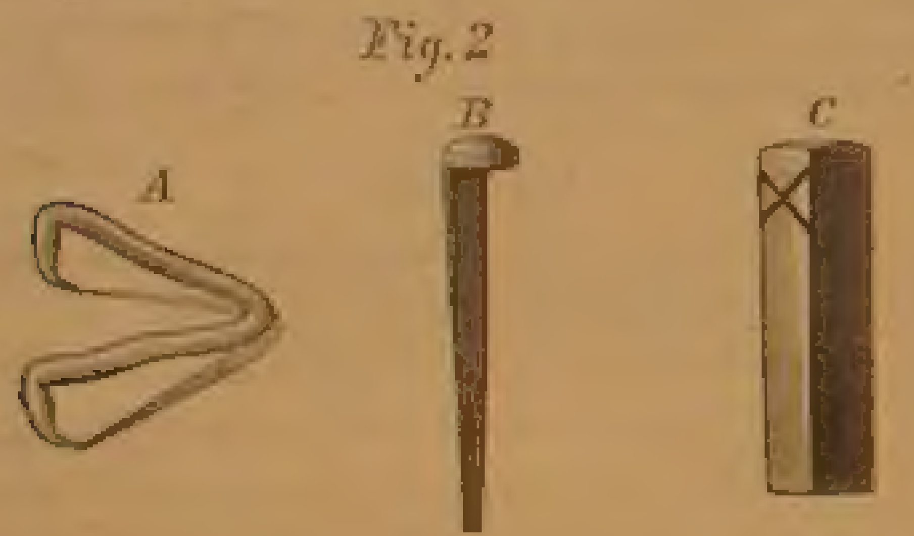
The invention which forms the subject of the present article discards the old method of fastening carpets with tacks, and employs a stretcher of light and portable form, and of great efficiency.

The method of applying this stretcher to work is shown in Fig 1. It will be seen that instead of being obliged to stand upon the portion of carpet which it is desired to stretch, as in the old method, this stretcher permits the placing of the body to one side of the work, and the raising of the carpet from the floor while being extended, thus stretching the carpet entirely across the floor unobstructed by friction upon the boards.

The carpet is held by double-hooked wire loops, A, Figs. 2 and 3. The hooks are inserted in the carpet just inside the hem, or through the margin on the unhemmed sides, and are looped over nails headed only on one side, the form of which and their manner of insertion into the floor is shown at B in Figs. 2 and 3. A metallic gage, C, Figs. 2 and 3, being placed between the nails and the washboard in driving serves to secure a uniform distance from the washboard, and hight from the floor. The hook, nail, and gage are shown full sized in the engravings.



WEAVER'S CARPET STRETCHER AND FASTENER.



The construction of the stretcher and its application are well shown in Figs. 1 and 4. D, Fig. 4, is a portion of the wooden bar, or lever, which is made about three feet in length. E is a flat plate of cast iron, with double wire hooks inserted to engage with the fabric when in use. This plate is pivoted to a clip passing around the end of the lever, D, and from which it may be removed by depressing a spring, and put in from the opposite side so that the lever may be worked either with the right or left hand, as may be desired. F is a looped wire, which, when placed over the head of one of the nails forms a fulcrum for the lever, D. A strong bent wire, G, forms a fulcrum on the top and the bottom sides of the lever, D, so that as the carpet is stretched by pulling back the lever, it may at the same time be raised from the floor by pressing the end grasped by the hand toward the floor.

Thus the nails may all be uniformly driven first, and the carpet neatly and expeditiously extended and fastened to them by the aid of the stretcher and the hooks.

It is entirely superfluous to dwell upon the superiority of this method of laying carpets, or the saving of time and backache and temper effected by it. These facts will at once become evident to even the most unpractical reader.

The hook and nail fastening was patented by Willis Weaver, of Salem, Ohio, October 13, 1866, and that on the carpet stretcher April 13th, 1867, by the same. Both patents were obtained through the Scientific American Patent Agency.

Communications may be addressed to the inventor as above.

We presume that none of our readers will fail to notice the somewhat conspicuous advertisement of the American Saw Company, which appears in this number. We tried to persuade this enterprising company that a less prominent advertisement would answer their purpose just as well, but they would not listen to our advice, therefore we felt obliged to surrender to their exorbitant demands. It is a costly advertisement, but it pays to advertise a good article.

The Attorney General's Decision upon Patent Fees.

Attorney General Hoar has given a decision which reverses the action of the Patent Office, under Commissioner Foote, in relation to appeals taken from the decision of the Commissioner to the Judges of the Supreme Court of the District. Under the eleventh section of the act of March 3, 1839, a fee of $25 was fixed to be paid into the Patent Office Fund, and by the office to the court when the appeal was carried there.

By the act of March 2, 1862, all laws fixing the rate of Patent Office fees to be paid were repealed, and a new list of rates was established. In this list no mention was made of this $25 charge for an appeal to court, and Commissioner Foote held that the law was consequently repealed, and refused to receive any fee upon such appeals. The Attorney General decides that the fee is properly chargeable on the general ground that it is a court fee, and that the Patent Office is simply the temporary custodian of the money.

IMPROVED AIR CARBURETER OR GAS CHANDELIER APPARATUS.

The obstacles which have hitherto prevented large success in many of the numerous devices for charging air with the vapors of light fluid hydrocarbons have chiefly arisen from the liability of such vapors to condense at low temperatures and obstruct the pipes used to convey the mixed air and vapors to the burners, and also the small amount of such vapors absorbed by air in cold weather. To obviate the latter difficulty, heaters have been employed, but the liability to condense, still remains.

The invention we now are called upon to describe, seems to have surmounted both the above named obstacles. Although the engraving which illustrates the device is that of a chandelier, the invention is equally applicable to a bracket, or any other style in which the ordinary gas burners are mounted. The principle of its operation is exceedingly simple.

A is a pipe through which pure air is forced by means of the reversed motion of a common wet gasmeter impelled by a weight and the necessary gearing. This pipe is so formed that the air in its passage is brought directly over the burner at the bend of the pipe and heated thereby. It then passes on and issues in small streams through the perforations at B, and rises thus finely divided through a stratum, C, of fluid hydrocarbon contained in an air-tight vessel, D. Thus volatilizing the fluid and becoming charged with its vapor, it passes into the open mouth of another tube, E, rising above the level of the fluid in D, and so on to the burner.

When argand burners are used, disks of mica, F, are attached to the tube, A, at the bend directly over the burner and brought down to about one eighth of an inch from the tops of the chimneys. The inventor claims that this arrangement stops the rapid draft of air in the chimney, and enables the incandescent carbon which is the light giving agent in all flames, to remain longer in a state of incandescence, thereby rendering the flame larger and increasing its luminosity. In the ordinary bracket these disks are not used. Instead, the pipes are formed into an ornamental knot at the point where they turn over the burner. The pipes are furnished with wire gauze between the liquid and the burner to prevent any chance of the flame running back.

The inventor assures us that gas can be made by this process at a cost of 75 cents per 1,000 cubic feet and of a light giving quality far superior to coal gas, and as the liquid is confined completely from contact with surrounding atmosphere in the process is perfectly safe.

Country houses can, by having their chandeliers constructed on this principle, make their own gas and without the use of an expensive gas machine.

The same method seems equally applicable to the enriching of ordinary gas; and probably a considerable saving might be made by its use in rural towns where gas works are small the price high, and the quality of the gas furnished none of the best. Patented through the Scientific American Patent Agency May 25, 1869.

Further information may be had by addressing C. F. Dunderdale, 90 Wall street, N. Y., from whom County and State rights may be obtained.

Pacific Railroad Time Table.

The following statement of time and distances is given by the *Western Railroad Gazette*:

	Miles.	Hours.
New York to Chicago, Ill.	911	36¾
Chicago to Omaha, Nebraska	[illegible]	[illegible]
Omaha to Bryan	[illegible]	[illegible]
Bryan to Ogden, Utah	[illegible]	[illegible]
Ogden to Elko, Nevada, via Central Pacific R. R.	278	[illegible]
Elko to Sacramento, Cal., via Central Pacific R. R.	[illegible]	21
Sacramento to San Francisco, via Western Pacific R. R.	117	3¾
	[illegible]	161¾

Thus a total distance of 3,353 miles is made, according to the present schedule time, in 6 days and 17¾ hours, actual time, by a traveler's watch, from which we deduct 3¾ hours, difference of time, when going West, leaving the apparent time consumed in making the trip 6 days and 14 hours.

At San Francisco the mails will connect with the various steamship lines running on the Pacific, and may be landed at Honolulu in 9 days from that city, or 15¼ days from New York. They can reach Japan in 19 days from San Francisco, or 25¼ days from New York, or 33 to 34 days from Great Britain—thus beating the British mails sent via Suez, three to four weeks. The trip between Yokohama, Japan, and either Hong Kong or Shanghai, is readily accomplished by the Pacific Mail steamships in from five to six days, which, added to the time in reaching Japan, will give the through time necessary to reach either of the above-named ports of China.

The mails for Australia, it is thought, will hereafter go via San Francisco, as the Australian and New Zealand Steamship Company intend transferring the terminus of their line, which has been running from Sydney to Panama, so as hereafter to run from Australia to Tahiti, thence to Honolulu, and thence to San Francisco, making 28 days schedule time, which will give us monthly mail to Australia in 34 or 35 days through time.

Important Decision about Patents—Rejected Cases.

The Commissioner of Patents, Hon. S. S. Fisher, has made an important decision, involving a point of much interest to a large class of inventors, as well as to the public generally. Prior to the act of March 2, 1861, rejected applicants were permitted by law to withdraw their applications, and receive back two thirds of the fee. This practice was abolished by the act referred to. Many inventors now seek to revive these applications, claiming that the rejection was through the faulty or imperfect consideration of the Bureau, and hoping for better success under a changed administration. In many cases numerous patents touching these same inventions, or points therein, have since been granted, which could only be regarded as infringements, if the rejected application was to be reopened and granted as an original case. The Commissioner has heretofore decided that when an application is not renewed within two years after withdrawal, its continuity is broken. The decision, which is a very able one, is printed in full in another column.

A stuffed cat, placed upon strawberry beds, is said to effectually drive away birds.

Scientific American.

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VOL. XX., No. 26....[NEW SERIES.]....*Twenty-fourth Year.*

NEW YORK, SATURDAY, JUNE 26, 1869.

Contents:

A WORD TO NEW FRIENDS AND OLD.

The present number closes the twentieth volume—new series—of the SCIENTIFIC AMERICAN. In it we have striven to fulfill the promises made at the close of the last volume, and assurances have reached us from all parts of the country that our labors have been appreciated by our numerous readers.

In this effort we have adhered as much as possible to our former policy of popularizing science, and making it available to the masses. The great developments which are now making in all departments have each received their due share of attention, and progress in the mechanic arts has found a careful and impartial record in our columns.

We are glad to learn that the valuable series of articles on the manufacture of beet root sugar which have found a prominent place in this volume, have largely attracted the attention of capitalists and agriculturists, and that there is a strong probability that this industry will soon be attempted on a larger scale than ever before in this country.

Our subscription list has steadily increased, and the value of the SCIENTIFIC AMERICAN as a medium for advertising has been recognized by appreciative patrons of that department.

We are glad to learn also that many employers have acted on the hint we gave them at the close of our last volume, and are furnishing our paper to their employés, and, in other cases, inducing them to subscribe for it. Surely the information to be gathered from our pages is of the highest value to any young man who has any ambition to be other than a mere hewer of wood and drawer of water in this busy world.

Our correspondents ask us many questions which are patiently answered. The information thus given forms a valuable department in our paper. We also receive much information of general value from esteemed correspondents. We trust that any reader who has practical information which he deems of value will not be deterred by modesty or fancied lack of acquirements, from communicating with us. Valuable facts, though clothed in ungrammatical language, are always acceptable to us. Give us the facts and we will attend to the grammar and orthography.

It is encouraging to feel that we have the hearty co-operation of all our readers in making the SCIENTIFIC AMERICAN, *par excellence, the* mechanics' paper of the United States, but while we constantly bear in mind the requirements of this large and useful class of our population, we shall also endeavor to make our paper one which no intelligent reader, be he mechanic or farmer, or a professional, can afford to do without.

Heartily thanking our subscribers for their liberal support which alone enables us to make and sustain as good a paper as we give them, we assure them that we shall not remit our efforts to furnish them weekly an intellectual repast which, we are confident, cannot be obtained for the same money anywhere else in the world.

ON THE IMPORTANCE OF PROPER ARRANGEMENT IN SHOPS.

Our attention was called recently to a defect altogether too common in small manufacturing establishments; namely, the want of proper arrangement in machines employed to do the work. The occasion referred to was a visit to one of the many smaller manufacturing establishments to be found in this city.

We found in this establishment a company of orderly and conscientious operatives, intent upon their work, a foreman who managed them with admirable tact; everything about the establishment cleanly; plenty of light and air; but the arrangement of the tools and fixtures was very bad.

The nature of the work required the employment of several kinds of workman, each performing his portion of the work, and then leaving it to be further perfected by subsequent operations. The articles made were of a small and cheap kind, and as fast as each workman finished his part of the work they were carried, by a set of boys employed for that purpose, to the next operative.

Now the whole of this carrying was necessitated by want of foresight in the arrangement of the machines. We pointed out to the foreman that everything could be arranged so that one workman could, without any appreciable addition to his work, pass his work directly on to the one whose service was next required, thus abolishing the necessity of carriers, and making a saving of perhaps some sixty dollars per week to the establishment. This saving would, in a few weeks, reimburse the trouble and expense of the change.

The fault we allude to is most frequently to be found in establishments devoted to the manufacture of new lines of goods, in which the arrangement of the implements required has not been settled by practical experience. Such manufactories are most frequently conducted and owned by men who have either had little experience in manufacturing, or whose attention has been given to work of a very different character. The perfection of arrangement is to be found in cotton, woolen, and silk manufactories, where to disregard it would be utterly fatal to success. It has also been thoroughly studied in all manufacturing of long standing and of extensive character. Many inventors, who have devised an article of general demand, engage in the manufacture themselves, thinking that all will be plain sailing, forgetting that everything requires two inventions. It is not enough to invent an improvement; the inventor must also invent the best method of making it, if he would succeed.

This collateral invention comprises not only the tools, machines and appurtenances necessary to perfect the original device in a cheap and elegant manner, but also includes the proper adjustment and arrangement of all these details so as to reduce the amount of help, shop-room, fuel, and other expenses, to the minimum quantity.

We have in mind an invention which cost only a hundred dollars or so to perfect and patent, but which has cost the inventor some eighteen thousand dollars in devising how the article could be made at a handsome profit to the company engaged in producing it. A patent railroad spike cost its projectors one hundred thousand dollars in experiments on machinery to make it cheap enough to compete with other spikes already in market. Many inventors fail to take this into consideration in time. When their device is perfected, they should immediately turn their attention to modes of manufacture, so as to be ready, when the time comes, with the necessary resources to meet such exigencies as are likely to arise. In doing this they will often be able to make patentable improvements in existing machines, of great value to other branches of mechanical work.

POWER REQUIRED TO DRIVE A SEWING MACHINE.

In our article on the "Effect of Sewing Machines upon Female Health," published on page 378, current volume, we made a statement in regard to the power required to drive a sewing machine, estimating it as being one tenth the power of the average human frame. The total power of the human body was estimated at 4,166·66 foot-pounds per minute, which would give for the power required to drive average sewing machines, according to our estimate, in round numbers, 416 foot-pounds per minute.

In some inexplicable manner a blunder was made in the first division by ten, the quotient of which was put down as 466—instead of 416—foot-pounds. The final result was, of course, vitiated by this error. It should have been 249,600 foot-pounds per day of ten hours, instead of 270,600 foot-pounds, as stated, equal to 132 cubic feet of water falling 30 feet instead of 143 cubic feet.

Our estimate has been criticised as being evidently too large. It was based upon some rude experiments with an improvised apparatus, with which, however, we obtained results which assured us the amount of power we stated was sufficiently within bounds.

As our estimate was questioned, we took the trouble to call upon several manufacturers, every one of whom assured us that our statement must be nearly correct. It was, however, only at one establishment we could find any positive information. By the courtesy of Mr. J. M'Call, the gentlemanly manager of the Elliptical Sewing Machine Company, we were able to gain the following important facts, which will be of use to all interested in sewing machine motors.

First, it takes on an average, one eighth of a horse power, furnished by steam or other motive power, to run one sewing machine; three fourths of the power being lost or wasted in stoppages, in checking the motion of the machine, in running slow and fast, etc., etc. It is from not appreciating the great loss of power arising from the above causes that most of the motors invented for this purpose have proved failures.

When the ordinary treadle motion is used, if proper adjustments are made, one thirty-second of a horse-power will do the work or a little more than one thousand foot-pounds per minute. This makes the average power required about one fourth of the power of the human frame. But as many machines run much lighter than the average, we are assured that our estimate intended for the power required for domestic machines and light sewing, is not far out of the way, and that it is certainly within bounds. The figures obtained from Mr. M'Call are based upon actual experiment.

It is a common error to estimate the power required to drive small machines entirely too low. We venture to say that were the generality of mechanics to estimate without test the number of watches that could be driven by one horse-power, they would be more likely to make the number double what would be correct, than to make it less. The cause for this arises from the want of a proper appreciation of the difference between the total power of a *motor*, whether animal, man, or steam engine, that can be exerted for a short time in case of an emergency, and that which it can do continuously.

A man can run for a short space almost as fast as an average horse. Without doubt many men can run at the rate of a mile in four minutes for a short space; but few men can accomplish four miles an hour for ten hours. An average man could probably raise, under favorable circumstances, twelve thousand pounds one foot high per minute for one or two, or perhaps five minutes, but put him at continuous lifting and he cannot do half that.

It takes but little power to move the treadles of a sewing machine once; but to do it one hundred times a minute, or even sixty times, is another matter; allowing a small quantity of force only to each half stroke, a computation will show the aggregate for ten hours to be something considerable.

THREATENED EXTINCTION OF PATENT RIGHTS.

In our last issue we briefly noticed that a motion had been introduced into the English House of Commons to abolish the patent system. We have since received files of the English scientific journals, which uniformly oppose the proposition as unjust and not likely to receive the sanction of the government.

In another column we print a spirited article upon the subject from the *Scientific Review*. *Engineering* also denounces the scheme in an able editorial article, and while recognizing certain evils connected with the English patent system, it characterizes the proposition to abolish as "cutting off the head of a patient in order to get rid of a tumor or wen." The *Mechanics' Magazine*, a journal which has long sustained the rights of inventors, gives an account of the proceedings of a committee delegated on behalf of the "Inventor's Institute," to wait upon the Attorney General, for the purpose of presenting to that officer their views of the importance of the patent laws to all the industrial interests of the nation.

The Attorney General expressed himself as opposed to the motion which had been introduced by Mr. Macfie, who seems to be a very insignificant personage, but nevertheless capable of doing some mischief.

The Committee submitted to the Attorney General the following cogent reasons why the motion of Mr. Macfie should not prevail:

1. It is the duty of the state to encourage invention by every legitimate means, in order to enable this country to maintain its supremacy in mechanical and chemical arts.

2. That the inventor is entitled to reasonable remuneration for his labor, expenditure, and skill, equally as much as the author or the artist is entitled to copyright for his book or work of art.

3. That the patent system, though defective, is the best practical method of remunerating inventors yet devised, inasmuch as under it those persons only who use inventions, and to whom, therefore, they may be assumed to be of service, pay for them.

4. Experience shows that no system of rewards from the state could ever be made to work satisfactorily, either in the interests of inventors or the public.

5. The inventor, as distinct from the manufacturer, has a right to be heard before the patent laws are abolished or materially altered.

6. Inventors—and specially those belonging to the working classes, to which classes the great majority of inventors belong—are entirely opposed to the abolition of the patent laws, though they earnestly desire their amendment.

7. That by a good system of patent law the progress of the trade and industry of the country would be largely benefited, as the whole inventive talent of the nation will be thereby incited to strenuous and continued efforts to maintain our industrial position against the very active pressure of foreign competition now affecting our commercial prosperity.

8. That working men, who are largely represented by the present deputation, are especially anxious to find themselves in a position, under an amended patent law, in which they can not only safely exhibit their inventions in public, but be enabled to reap the fruits of improved education and increased application of invention.

RENEWED VIGOR AT THE PATENT OFFICE.

Commissioner Fisher is infusing life and energy into the Patent Office, such as it has not experienced since the days of Mason and Holt. Applications which have been allowed to accumulate under recent Commissioners are being examined and disposed of very rapidly, and we hope soon to be able to announce that the files in the Examiners' rooms are clear of pending cases. On a single day—Friday June 11th—we received circulars of allowance of THIRTY-SIX patents, on applications made through our Home Office, exclusive of those prepared at our Washington Branch Office. If the new Commissioner continues thus energetic in his management, he will secure and deserve an enduring popularity.

Now that the Commissioner has his hands well hold of the plow, we trust that he will neither hesitate nor turn back.

CORRECTION.—Mr. Gallatin, in his communication on a "New Method of Constructing Induction Coils," page 390, current volume, omitted to state the following important facts regarding the wire wound upon the three hard rubber bobbins: "The center bobbin contains 3,000 feet and the two others together 4,500, in all 7,500 feet of wire, weighing 25 ounces avoirdupois."

HENRY CAREY BAIRD of Philadelphia, the veteran publisher of practical and scientific books, has just published a new and enlarged catalogue which contains a complete list of his valuable industrial publications. This catalogue is forwarded free by mail on application.

IMPORTANT DECISION ABOUT REJECTED CASES.

In the matter of the application of John W. Cochran for letters patent for Improvement in Breech-loading Arms.—The question presented for decision in this case is one of great importance. I have considered it with care, for, I am advised, that there are many cases pending and constantly arising in the office, the determination of which may be affected by my decision.

Cochran filed this application January 17, 1859. It was rejected February 8, 1859. On February 20, 1859, he filed the following paper, and received $20 of his original fee:

To the Commissioner of Patents:

SIR: I hereby withdraw my application for a patent, for firearms, now in your office, and request that twenty dollars may be refunded to me, agreeably to an act of Congress in such cases made and provided.

J. W. COCHRAN.

Washington, February 20, 1859.

Applicant did nothing further until May 5, 1868, or more than eight years afterward, when he filed a new application, now under consideration. It contained three claims, all of which were rejected by the primary examiner. Upon appeal to the Board of Examiners in Chief the case was remanded to the primary examiner for inquiry, and report as to the number of patents granted after the withdrawal, and before the second application in which the same invention, in other combinations, or as part of the descriptive matter.

Upon his report, it appeared that the devices specified in the first and second claims were found in some eighteen different patents, granted within the period named, but that no patent was found showing the devices specified in the third claim; the board affirmed the decision of the primary examiner in rejecting the first and second claims, and reversed his decision as to the third claim, which they allowed.

An appeal has been taken to me from the decision of the board in refusing to allow the first and second claims. The question before me may be thus stated: Can an inventor withdraw his application, make no effort to renew it for eight years, during which time the subject-matter of the invention has been incorporated into the substance of many subsequent inventions, and then file a new application and obtain a patent, which, to support the novelty of the invention, shall relate back to the first application?

Many conflicting opinions have been entertained upon this question. The practice of the office has not always been consistent. Patents may be found, doubtless, that have been granted under circumstances similar to those of the present application, and similar cases may also be found where patents have been refused. This is in part owing to the fact that, of twenty examiners, any one may pass a patent for issue, and the issue, if favorable to the patentee, is not the subject of appeal.

The decisions of the appellate judges and of the courts upon this subject have not been more uniform than those of the office. Authorities upon this question, relating to patent law, may readily be obtained upon both sides.

Prima facie, it would seem, that an application, deliberately withdrawn, was abandoned, and could no longer form a foundation for a second application; and that, if such second application was made, it must be entirely independent, and could derive no support from the first. That, if public use intervened between the withdrawal and the second application, and for more than two years before the filing of the latter, the patent, if granted, must be void.

This was the opinion of the judge who tried the case of Godfrey vs. Eames on circuit. In this case the first application was withdrawn and the second filed upon the same day.

Upon the trial, it appeared that the invention had been in public use for more than two years before the second application, but for less than two years before the first.

The Court charged the jury that the continuity of the application was broken by the withdrawal, and that the public use must date back from the second application.

The Supreme Court (Godfrey vs. Eames, 1. Wall, 317) held that this was error; but it is important to note the grounds of this decision. The Court says: "In our judgment, if a party choose to withdraw his application for a patent, and pay the forfeit, intending, at the time of such withdrawal, to file a new petition, and he accordingly does so, the two petitions are to be considered as parts of the same transaction, and both as constituting one continuous application, within the meaning of the law.

"The question of the continuity of the application should have been submitted to the jury."

It is obvious that the courts do not mean to declare that the two petitions constitute one continuous application, no matter what may be the interval between them, and that the fact of the filing of the second petition is evidence that the intention to do so existed when the first was withdrawn; for, they say that there is still a question of continuity to be submitted to the jury; and this obviously means, that the jury are to judge of the question of the intention of the patentee in withdrawing the first application, and whether the interval is so long between the applications as to destroy the continuity; or to rebut the presumption that upon withdrawing the first application, the patentee intended to file the second.

The case of Godfrey vs. Eames, was a suit at law. If it had been in equity, the question of intention and of continuity would have been submitted to the judge to be determined like any other question of fact.

On an application for the issue of a patent, it is the duty of the Commissioner to decide all questions both of law and fact, which go to establish the right or the absence of right in the applicant to a patent, Marcy vs. Trotter, Dunlap J. 1860.

The questions of the intention of the applicant and of the continuity of the application are therefore submitted to the commissioner for his judgment, precisely as they could be submitted to a Court of Equity. The foundation of this judgement is, I think well set forth by Judge Dunlap in Simpson *ex parte*, in 1861. He says: "a rejected applicant who has withdrawn his application may renew it, provided the renewed application is made within a reasonable time after the withdrawal of the fee."

Nothing is more common than to submit the question of reasonable time or reasonable diligence as a question of fact or adjudication. The difficulty of coming to a conclusion, does not obviate the necessity of a decision, and no judge is justified in evading the responsibility of deciding any point which properly arises.

Among the analogies which might be referred to, is the ordinary case of the failure to present a draft for payment within a reasonable time after it becomes due. The drawee fails and the drawer is discharged from liability, no time is fixed for the presentation of the draft, but the law declares that it must be presented within a reasonable time, and submits to a court or jury the question as to what is or what is not reasonable.

I am satisfied that, in every case like the present, the Commissioner must judge whether or not the application is continuous, or whether the continuity is broken by a failure to file the second petition within a reasonable time after the withdrawal of the first.

As to what constitutes a reasonable time, I am not without the light of authority. In the case of Simpson *ex parte*, above cited, the learned judge says: "Section 7, of the act of 1861, fixes what is a reasonable time. There is no reason why a renewed application should have more than two years allowed it, computing the time from the date of the withdrawal. Both classes of applications, original and renewed, are applications for patents, and come within the letter and spirit of the statute."

This view is enforced by the fact that, by the act of March 2, 1861, the applicant is required to complete and prepare his application for examination within two years after the filing of the petition, and that, in default, of such preparation, the application shall be regarded as abandoned.

These provisions of the patent law seem to establish a *quasi* statute of limitations, which may safely form a guide for the Commissioner in determining the question of reasonable diligence.

It must be remembered that withdrawn applications were those which had been but once rejected. The inventor might have insisted upon a second examination—might have appealed to the Commissioner, to one of the Justices of the Circuit Court. He did none of these things; while claiming to have been rejected by the fault of the Office he took no single step to correct the action of which he complained. He withdrew his application, waited eight years, and now applies again. Meanwhile his device has been copied in various forms in no less than eighteen subsequent patents. If his application takes date from the filing of the new petition, he is clearly anticipated by these patents. If it is to date back to the filing of the first petition, these subsequent patentees will be infringers. It is not a sufficient answer to say that the first rejection was improperly made, and that therefore all the evils which may follow the granting of his patent at the present time, are the fault of the Office and must be charged to the Commissioner. This is a fallacy. If the Office was in fault in the original rejection, the law provided a mode of correcting the fault, which it was as much the duty of the applicant to pursue, as it was to file his original application. The law neither points out nor recognizes such a mode of correction as a withdrawal of the application for the purpose of endeavoring, under some new Commissioner, to obtain a reversal of the sentence. If the patentee refuses to adopt the remedy given by the law, and substitutes one of his own making, he does so at his peril; and, when he applies again, it is as much the duty of the Commissioner to protect subsequent *bona fide* inventors and the innocent public against his *laches*, as to protect him against the errors of former examiners. The remarks of Chief Justice Cartter, in Goodyear and Bacon vs. Hills, 3 Fisher, 134, in commenting upon the Cummings patent, are strongly in point. It is to be noted that although in this case the second application had been made eight years after the first, yet, that the first had never been withdrawn. Judge Cartter says: "The law makers have admonished inventors and the public, that if before an application they suffer more than two years to elapse in the use of the invention, they shall absolutely forfeit all right and title thereto. It is true the legislative admonition relates to the period preceding the application. But, it appears to me, as far as the Court can be guided by its own judgment, that the inventor is left under the dominion of common law principles, in regard to any *laches* by which the application may be followed. Is it the law because an inventor files his application, which is refused by the Office, he may sleep upon his rights indefinitely, and that at any period in his lifetime, or that of his representatives, the application may be revived, as against the public? I think not. *Prima facie*, I think he would have to show a reason why he should be so persuaded. The judgment of condemnation by the Office advertises to the country, at least, that he stands in no better position than before the application was made. The country is advised by the deliberation of the only tribunal provided by law for the ascertainment, at that stage of the invention, of his right, that he has none. More especially is he himself advised of that fact, for he is a party to the proceedings, and more immediately damnified by the rejection of the application. That rejection would at least be regarded in the logic of equity as a notice to him to proceed with diligence to traverse and reverse the judgment of the Office."

In Blandy vs. Lippincott, 2 Fisher, 1, Mr. Justice Grier says, in his charge to the jury: "If you find that the application of 1836, renewed in 1837, was for this same subject-matter now patented, and if such application was not withdrawn by Fitzgerald, but the delay was caused by the conduct of the Commissioner of Patents in refusing to grant the patent for the same invention since patented, then Fitzgerald should not be considered to have abandoned his invention to the public. On the contrary, if you believe that the application of 1836 and 1837 was not for the same invention with that patented, and, was therefore, refused by the Commissioner, or was withdrawn and abandoned by the applicant, and continued so until Knox Winder got up an application for the present patent, and, in the meanwhile, the invention had gone into public use for more than two years, then you will find this point for the defendants."

See, also, Ruff vs. Daniels, 2 Fisher, 377. Mr. Justice Fisher, who now sits in appeals from this Office to the Supreme Court of this District, has, in the late case of Howley vs. Mason, made a decision, the reasoning of which logically leads to the conclusion which I have arrived in the present case. If the applicant had been put into interference with one of the eighteen inventors who have shown his device in their patents, and had attempted to prove an invention made eight years before and dropped, he would, under the authority of that case, be held to have abandoned his invention. *A fortiori* must this be so, when we find that instead of using diligence to obtain a patent, he deliberately and formally withdrew his application from the Office and gave no sign of life for eight years, while eighteen patents were granted more or less affecting his rights. While it need not be asserted that the present applicant was setting a trap for these subsequent patentees, it is obvious that, to sustain the present application, would be to offer strong inducements to others to set such traps hereafter.

The decision of the Board of Examiners in Chief is affirmed.

(Signed) S. S. FISHER, Commissioner

June 8, 1869

HOOP SKIRT LITIGATION.

BEFORE JUDGE BLATCHFORD.

Samuel H. Dougherty vs. Joseph J. West et al.—This was a suit in equity to restrain the infringement of a reissued patent, granted to the plaintiff on August 1, 1865, for an "Improvement in skeleton skirts." The patent was originally issued October 4, 1859, to the plaintiff, James H. Draper, who was the inventor, and it was reissued on December 21, 1859, and the plaintiff, by assignment, became the owner of the entire interest in it. He brought a suit on it against two of the defendants in this suit, the decision in which is to be found in 1, Fisher's Patent Cases, 353, in which the Court held that the plaintiff could not recover what was claimed by him without a reissue. That decision was made in June, 1865, and the present reissue was granted in August, 1865.

The bill charges as an infringement of the patent the making and selling of skeleton skirts by the defendants. One of the principal defenses set up to the bill is that Draper was not the original and first inventor of what is covered by the last reissue, and much testimony has been introduced by the defendants for the purpose of establishing the existence, before the time of the invention of Draper, of skeleton skirts similarly constructed. The main questions discussed on the hearing were, whether Draper was an original, and, if so, the first inventor of the improvement claimed in the last reissue, and whether he made such invention before the time when he applied for his original patent.

A good deal of testimony was submitted by defendant, but Judge Blatchford decided that the plaintiff had made out his case clearly, and to his (the Judge's) entire satisfaction, and decreed a perpetual injunction and an account, with reference to a master, and for costs of suits.

PATENT FOR STRETCHING CHAINS---NOVELTY.

BEFORE JUDGE BLATCHFORD.

Charles Hall vs. James Bird.—This was an action for an infringement of a patent granted to the plaintiff on May 30, 1864, for a machine for stretching chains so as to make the links of uniform length. The defense set up was that in 1857 the defendant's father had a machine built for him for stretching chains, which he placed in his cellar and used, but which he kept concealed from persons in general; that this machine, after a while, was no longer used, his father having died in 1862; but in 1865 he removed the machine from that cellar into his shop, where it was fitted up, used to stretch chains, and that this was the infringement complained of. It appeared, however, that in 1864, the plaintiff's machine was described to the defendant by a workman in his employ who had seen it, and that till the removal of the old machine, the defendant had stretched chain links by hand, with the hammer and anvil.

Held by the Court.—That on the facts of the case, the knowledge of the defendant's machine was as effectually lost as if it had not been constructed, and the plaintiff's invention was new and unknown, and patentable, notwithstanding the existence of the defendant's machine. (Gaylor vs. Wilder, 10, How., 477). That the defendant has failed to establish the identity of the old machine with the machine now used by him in one important particular; namely, in the provision in the jaws of the tongs for grasping the links of the chains, so as not to injure it or any other link. That on the evidence the plaintiff is entitled to recover, but as he has failed to establish any specific amount of damages, the amount awarded will be only six cents.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The impracticability of so connecting the waters of Lake Superior with the Mississippi to obviate the difficulties arising from low water in that river during the dry season, is thus shown in a letter to the *Press* by a St. Paul engineer: "The surface of Lake Superior is variously estimated to be from 600 to 650 feet higher than the ocean level; Lake St. Croix from 666 to 684 feet above the ocean level; the Mississippi river at St. Paul about 14 feet higher than Lake St. Croix; the mouth of Chippewa river about 30 feet lower than St. Croix lake, and therefore Lake Pepin must be about 40 feet higher than Lake Superior."

Last year 295,890 persons were employed in coal mining in England and Wales, and 39,160 in Scotland. The quantity of coal raised in Great Britain was 104,566,959 tuns. There were 899 separate fatal accidents, and 1,011 lives lost, the proportion of persons employed for separate fatal accidents being 403, and 343 employed to every life lost. Every 103,429 tons of coal raised appears to have cost a life. These operations were carried on in 3,262 collieries. There were also 69 lives lost in ironstone mines.

In the United States Court at Cincinnati, in the case of the Government against five cases of imported reprints of American copyright books, part of seventy-eight cases seized for non-payment of Government duties, Judge Leavitt has decided that these books reverted to the copyright owner upon the payment of Government tax by him.

Every lumber yard in Hannibal, Mo., has a switch from the railroad into the yard. The cars are pushed into the yard by a "pony engine" and there loaded, when they start on their destinations, whether along the Hannibal and St. Joseph Railroad, the Cameron, or crossing the Missouri at Kansas City and thence into the State of Kansas.

On Saturday, June 5, two colored carpenters, formerly slaves, commenced work in the Washington Navy Yard. This is the first time, says the *Herald*, that colored mechanics of this class have ever been employed in the Washington Navy Yard upon an equal footing with white workmen.

At San Francisco the Chinamen have been set to work at making cheap shoes, and imported goods of that class are driven out of the market. They now talk of giving them similar employment in Brigham Young's dominions.

A petition has been presented to the Common Council of Newark, for assistance to build a ship canal from Newark to this city. It is proposed to make the canal 200 feet wide with 20 feet depth of water at low tide.

The four spool factories at Weld, Belgrade, Farmington Falls, and Greenwood (Lock Mills), Maine, furnish two-thirds of the spools for the whole country.

A company has been formed at Ridgefield, Conn., with a capital of $300,000 to build a railway from that place to Port Chester, New York.

The work on the rolling mill to be erected by the Baltimore and Ohio Railroad Company has been commenced.

Twenty-four thousand acres of mineral land in Missouri were recently sold for $340,000.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

EXTENSION AND CHANGEABLE LADDER.—Wm. G. Phillips, Newport, Del.—This invention relates to a new sectional ladder which is so arranged, that it can be extended to any desired length, or that it can be transformed into a ladder or scaffold.

FURNACE FOR EXTRACTING ZINC FROM ORE.—Alois Thoma, New York city.—The object of this invention is to remove the inconveniences heretofore existing in the production of zinc and to simplify the labor connected therewith.

STOP MOTION FOR LOOMS.—John J. Switzer, Chelsea, Mass.—This invention relates to a new thread detector and stop motion for looms, whereby the injury to fabrics, produced by the breaking of threads is instantly prevented by the stopping of the machinery.

PACKING BOX FOR ROTARY STEAM DRYERS.—W. B. Fowler, Lawrence, Mass.—This invention relates to a new box for packing the fixed pipe in the end of a hollow rotating steam cylinder, and an drying apparatus of paper machines. The object of the invention is to so construct all parts, that the steam will serve to make a tight joint.

APPARATUS FOR ROASTING COFFEE, NUTS, ETC.—D. A. T. Gale, Poughkeepsie, N. Y.—This invention has for its object to provide an effective system of arranging the gas pipe and burner, an automatic power, and a device for allowing the wasting process to be carried on in a cylinder without revolving the same.

NAIL CLINCHER FOR HORSESHOES.—Nicholas Bepp, Waterloo, Iowa.—This invention relates to a new instrument for cutting and clinching horseshoe nails, and for filing the hoof under the clinched parts of the nails, said instrument being intended as a substitute for the four tools heretofore used for the same object; namely, a nail cutter, a nail head holder, a rasp, and a hammer for clinching.

SEED PLANTER.—F. E. A. Engelman, Cheektowaga, N. Y.—This invention relates to a new machine for planting seed to any suitable depth and in rows of suitable width, with or without fertilizing matter, and the invention consists in the general arrangement of parts, whereby the desired result is obtained, also in a new manner of making the seed cup adjustable, and in a novel arrangement for adjusting the apparatus to plant in rows at suitable distances apart.

BEEHIVES.—J. H. Bessler, Pine Grove, Pa.—This invention relates to a new manner of making the sides of beehives, and to the application of certain ingredients, used for that purpose, and it consists in a novel manner of arranging and constructing straw sides for the hives and of a novel cement used in connection with the straw sides.

FLY FRAMES FOR ROVING MACHINES.—J. G. Luscomb, Taunton, Mass.—This invention has for its object the production of a new apparatus for adjusting the belt on the cones of a fly frame, for regulating the velocity of the bobbins. The invention consists in a novel arrangement of devices for connecting the rack by which the belt is adjusted with the contact shaft and with a clutch gear whereby certainty of action and a suitable degree of decrease of motion are obtained.

SPRING BED.—Samuel Dunlap, Rome, Ga.—This invention consists in an arrangement of vulcanized india-rubber springs upon tension rollers at each end, extending across the space between the ends, the rollers being provided with ratchets or pawls for tightening or holding the springs.

WAGON WHEELS.—C. F. Carman, Hamburg, Iowa.—This invention consists in connecting two spokes to the hub in each mortice, one of which is dovetailed and keyed in to the mortise, similarly formed, by driving the other as a key, and both spokes of each pair have inclined tenons so that they branch in each direction to the rim, at distances from each other equal to the distances from one, to one of the next pair.

FRICTION CLUTCH AND BRAKE.—Darius Banks, New York city.—This invention consists in an arrangement of a loose sliding pulley with a conical projection, a set of friction rollers for imparting motion to the said pulley by frictional contact with the said hub, a fixed tubular brake with one or more internal annular flanges taking into grooves in the hubs of the wheels, and operating levers, all so arranged that a movement of the said levers in one direction connects the friction devices, and disconnects the brake, and the opposite movement disconnects the friction devices and, connects the brake.

CENTER BEARING FOR LOCOMOTIVES, ETC.—B. W. Healey, Providence, R. I.—This invention relates to improvements in supporting locomotives, tenders, cars, etc., on their trucks, and has for its object to provide a ball and socket connection for the same.

HARNESS.—John K. Harris, Springfield, Ohio.—This invention relates to the harness patented by H. C. Smith, July 10th, 1866, and improved by J. K. Harris, May 26th, 1868, and comprises further improvements upon said harness, for the purpose of making it lighter, safer, neater in appearance, more economical in construction and more convenient in operation.

PAPER BOXES.—H. A. Devendorf, Fort Jackson, N. Y.—This invention relates to an improvement in the manner of constructing paper boxes, whereby they can be made more economically and with less labor, while the article produced will be stronger and more substantial than the boxes hitherto made of the same material.

CAR COUPLING.—A. Z. Long, Scranton, Pa.—The object of this invention is to provide for public use, a simple and cheap automatic coupling for cars, so constructed that it is adapted to couple together cars of unequal hight, and also cars constructed for different gages of road.

HEATING STOVE.—H. E. Blemker, Evansville, Ind.—The object of this invention is to provide an attachable and detachable device of improved construction, designed to be attached to heating stoves in order to secure more perfect combustion of the fuel and smoke, a better draft, and better radiation of the heat.

MODE OF RAISING WATER.—David Jones, Newport, Wales.—This invention relates to a new and important improvements in the method of raising water by means of a vacuum produced by the condensation of steam.

COMPOUND.—Philip O'Reilly, Hartford, Conn.—The object of this invention is to provide a compound for producing a fine jet in black paints, and for other purposes.

WEATHER STRIP.—E. P. Ford, Shipman, Ill.—This invention relates to a self-acting weather strip to be attached to outside doors for stopping wind and rain.

STUMP EXTRACTOR.—William Smith, Pine Hill, Wis.—This invention consists, in general terms, of a gallows frame, provided at its upper part with a ratchet wheel and pawl lever, the shaft of the ratchet wheel bearing a gear pinion, which engages with another gear wheel on the winding shaft or drum. The stump chain, being attached to this latter shaft or drum is wound thereon when the ratchet lever is vibrated.

VEGETABLE GATHERER.—Jacob Schermerhorn, Dayaville, N. Y.—This invention consists in a rake or comb, having long curved metallic fingers suspended from the front of a pair of handles supported on an axle and wheels, and provided with a pocket so arranged that the operator pushing the machine in advance may cause the fingers to run along the ground under the articles to be gathered, which will, by depressing the handles below the level of the axle, freely roll down over a riddle into the pocket, said riddle being arranged between the fingers and the pocket, for separating small articles and other matter liable to be taken up.

MEAT-CHOPPING MACHINE.—Paul Clareton, New York city.—This invention relates to a new machine, by which meat, vegetables, and other articles can be rapidly and successfully cut into small pieces for sausage stuffing, and other purposes. The invention consists in the arrangement of a carriage, which supports a driving shaft and a series of cutters that are fastened to vertical guide bars. By turning the shaft, which carries a series of cams, the cutters are alternately raised, and are then thrown down with considerable force by means of powerful springs.

KNIFE SCOURER.—Samuel K. Goodsell and John Quincy Adams, Brooklyn, N. Y.—This invention relates to a new device for cleaning knives, forks, and other similar articles, and consists in a novel construction of a sliding rubber.

VELOCIPEDE.—J. W. McMillian, Greenville, Ala.—This invention relates to a new three or four-wheeled velocipede, which is so constructed that motion can be imparted to both axles at once, either by the hands or feet of the operator, or by both hands and feet combined. The invention consists in the general combination, with ratchet wheels mounted on both axles of connecting levers, treadles, and hand levers, all arranged in such manner that the aforementioned results can, without difficulty, be realized.

ZINC FURNACE.—Alois Thoma, New York city.—This invention relates to a new zinc furnace, which is so arranged, that it is doubled—that is to say, that the furnaces which are usually separated are, with their gas generators, built together to form in a single structure, the double furnace. Room, building, material, and labor are economized by this arrangement.

VIOLINS.—Jacob Lenhard, New York city.—This invention relates to an improved manner of securing the bridge to a violin or other bow instrument, with the object of securing greater freedom to the sounding board, to allow the same to vibrate with less difficulty than heretofore.

COMBINED TOILET AND NURSERY TABLE.—Henry Havekorst, Leavenworth City, Kansas.—This invention relates to a new table, which can be used as a toilet table, and which, as it can be supported on one single leg on the side, may be used as a nursery table, to have its top extending over the bed of a sick person. The table can also be used as a writing and reading desk, as it can be made high or low at will.

HAY RAKE AND TEDDER.—Frederick E. Searing, Brookfield, Conn.—This invention relates to a new horse hay rake, which is so constructed that it can be readily transformed into a hay tedder, and which is otherwise of very simple and convenient construction. The invention consists in making the rake head of two or more parts, so jointed, that some parts can be turned, to make the teeth project at different angles from the head, when it is desired to use it for turning hay.

STALL FLOOR.—Wm. M. Bleakley, Verplank, N. Y.—This invention relates to a new stall floor, which is arranged so that it can be taken up to clean the trench under it, and which is made with a view to cleanliness and simplicity of construction. The invention consists in constructing the floor of a series of slats which are at their front ends pivoted to a fixed cross bar, so that they can be swung up to clean the ditch under them, and which are so made, that crevices are formed between them to let the waters pass into the ditch.

VELOCIPEDES.—W. F. Hobbs and B. T. Babbitt, New York city.—The main object of this invention is to produce a novel mechanism for propelling velocipedes and other vehicles, by means of muscular or other power, said power being applied by persons, animals, or machines placed upon and conveyed by the said vehicles. The invention consists in the application of friction clutches to the edges of wheels to be revolved.

WRITING PEN.—James W. Truman, Macon, Ga.—This invention relates to a new writing pen, the point of which can always be fed up, when worn, so that the pen can remain in constant operation. The invention consists in arranging under a split, or non-split plate, which is shaped similar to the ordinary steel pen, an adjustable wire or rod, which, with its end, will form the writing point of the pen. The end of this wire, or rod, can be fed forward when worn, and used again, until the wire is almost entirely used up, and the wire can then be readily replaced. The ink is held and flows freely between the plate and rod.

CLOTHES RACK.—James Aborn, Charlestown, Mass.—The object of this invention is to provide a simple and efficient folding clothes rack, which may be readily adjusted to suspend the hinged holding bars horizontally for holding the clothes, or vertically, to hang in the most compact position, and without strain on the suspending parts.

HARROW.—S. G. Jones, Niantic, Ill.—This invention relates to improvements in harrows, and is designed to provide a harrow capable of being contracted or expanded in the direction of its breadth, to change the width for different kinds of work, also for folding to occupy but little space in storing.

PISTON PACKING.—John Gates, Portland, Oregon.—This invention relates to improvements in piston packing, designed to provide an arrangement, whereby a skeleton piston head, consisting of only one piece of metal, may be used, and the packing rings may be adjusted without the employment of screws, thereby dispensing with the usual follower, and tightening and adjusting screws, commonly employed.

LET-OFF MECHANISM.—Wm. M. Clark, North Adams, Mass.—This invention consists in an arrangement of worm gearing and bell-crank levers, for varying the pressure of friction straps on the beam heads.

GUN LOCKS.—H. D. Hay and J. M. Hill, Crooked Creek, N. C.—This invention relates to improvements in gun locks, having for its object to provide a movable nipple guard, which will prevent the hammer from falling upon the cap, in case of accidentally becoming disengaged from its holder by any means other than the regular action of the trigger in discharging it, and which will, by the action of the trigger, be moved out of the way of the hammer when regularly discharged.

CURRENT WHEELS.—J. B. Holmes, Lawrence, Kansas.—This invention relates to improvements in wheels, to be operated by the natural current of streams, for elevating water or propelling machinery, and consists in the arrangement and connection of the buckets together, and to the elevator or other device to be propelled.

MECHANICAL MOVEMENT.—Henry Shatts, Oregon, Mo.—This invention consists in an arrangement of an oscillating eccentric wheel and two sets of cams, said cams being arranged to act upon the face of the cam wheel at points opposite to each other, and the cams of each set being arranged to throw in opposite directions, and caused to transmit a reciprocating motion to a sliding bar.

CORN SHELLER.—F. Fanning, Atchison, Kansas.—This invention has for its object to furnish an improved corn sheller which shall be so constructed as to shell the corn rapidly and thoroughly, and which may be readily adjusted to hold the ear in contact with the shelling cylinder a greater or less time, according to the dampness or dryness of the corn to be shelled.

SPRING SADDLE-TREE.—John R. Bragg, Williamsburg, Mo.—This invention has for its object to furnish an improved spring saddle-tree which shall be simple in construction, while forming an easy and comfortable seat.

HANGING WINDOW BLINDS.—Daniel Kidder, Franklin, N. H.—This invention has for its object to improve the manner of hanging and operating window blinds so as to make them safer and more conveniently operated than the blinds hung and operated in the ordinary manner.

ANCHOR FOR ANIMALS.—P. H. Halford, Houston, Texas.—This invention has for its object to furnish an improved device for use in staking out horses and other animals to graze, which shall be so constructed and arranged that it will be impossible for the animal to twist or wind up the rope while grazing.

IRONING BOARD.—Andrew Mahan, Elizabeth, N. J.—This invention has for its object to furnish a simple and convenient ironing board, which shall be so constructed and arranged that when not in use it may be folded up so as to occupy but little more space than an ordinary ironing board.

BAG HOLDER.—E. A. Fisher, Morganville, N. Y.—This invention has for its object to furnish an improved bag holder which shall be so constructed as to hold the bag in either a vertical or inclined position while being filled.

SOLDERING MACHINE.—J. G. Borden and W. Power, Brewster Station, N. Y.—This invention has for its object to furnish an improved machine by means of which the heads of sheet-metal cans may be soldered to their bodies quickly and thoroughly and without waste or undue use of the solder.

CAR COUPLING.—Charles Layton, Matawan, N. J.—This invention has for its object to furnish an improved car coupling which shall be simple in construction and effective and reliable in operation, and which shall, at the same time, be self-coupling.

CORD ATTACHMENT OR HOLDER.—E. d'Hervanne, New York city.—This invention has for its object to furnish an improved attachment or holder for cords for hanging pictures and mirrors, and for other purposes, which shall be so constructed and arranged that the cord may be conveniently arranged and securely held in any position into which it may be adjusted.

FIRE-PROOF SHUTTERS.—Thomas Reese and William L. Reese, St. Louis, Mo.—This invention has for its object to improve the construction of fire-proof shutters in such a way that they may be unfastened and opened conveniently from the outside to enable the firemen to obtain ready access to the interior of the building, so that the water may be applied directly to the fire before it has attained too much headway to be readily extinguished.

LUBRICATING CUSHION FOR CAR JOURNALS.—P. S. Devlan, Jersey City, N. J.—This invention has for its object to furnish an improved lubricating cushion for car journals, which shall be simple in construction, easily put in and taken out of the journal box, which may be washed when necessary, without injury, and returned to the journal box, and which will absorb the oil and convey it to the journal so as to keep the said journal constantly lubricated.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.

NEW PUBLICATIONS.

A PRACTICAL TREATISE ON HEAT, as Applied to the Useful Arts, for the Use of Engineers, Architects, etc. By Thos. Box, author of "Practical Hydraulics." Philadelphia: Henry Carey Baird, publisher, 406 Walnut street. Small 8vo. Price, by mail, postpaid, $4·25.

A practical treatise upon this subject, comprising the results of the most recent observations and experiments, is very much needed at the present time, and both the author and publisher of the volume before us have conferred a great benefit upon the public by its timely publication. We would be glad to give it an extended review, adequate to its merits, but we must content ourselves at this time with an enumeration of the general contents of the work. These comprise: General principles and facts in the theory of heat and combustion, the principles and details of steam boilers, efflux of air, vapor evaporation, distillation, drying, heating liquids and air, transmission of heat and laws of cooling, laws of cooling at high temperatures, transmission of heat by conduction, ventilation, examples of heating and ventilation, wind and its effects upon heating and ventilation, etc., etc. The work is amply illustrated, well indexed, and printed in the excellent style which characterizes the industrial publications of Mr. Baird. It would be hard to perform the work which Mr. Box has undertaken in a more creditable manner than he has done it. To be at once brief and exhaustive is a difficult task for any author, but one in which this writer seems to excel.

A TREATISE ON ROPE MAKING, as Practiced in Private and Public Rope Yards. With a Description of the Manufacture, Rules, Tables of Weights, etc. Adapted to the Trade, Shipping, Mining, Railways, Builders, etc. By Robert Chapman, Master Rope-Maker of Her Majesty's Dockyard, Deptford, England. Revised Edition. Philadelphia: Henry Carey Baird, 406 Walnut street. Price, by mail, free of postage, $1·50.

The above is the title of a work upon an important subject, which has been hitherto too much neglected by writers on industrial topics. Intimately connected as it is with commerce and the security of vessels at sea, it is time that the public should be supplied with accurate information upon it. It is eminently practical in beginning with the discussion of the fiber of hemp, and proceeding, step by step, through all the intermediate processes necessary to complete the largest and most perfect cable. The work was evidently prepared to assist workmen in obtaining a knowledge of the calculations necessary to the art of ropemaking, and is eminently calculated to accomplish that purpose.

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ILLUSTRATIONS.

MISCELLANY.

Figures preceded by a star (*) refer to illustrated articles.

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PATENT CLAIMS.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who ask information from us; beside, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, and for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at $100 a line, under the head of "Business and Personal."

☞ All reference to back numbers should be by volume and page.

C. H. S., of Pa.—A pendulum that vibrates seconds in the latitude of New York city, is according to Saigey, 39.1393 inches in length, from the point of suspension to the center of oscillation. This length, or the known lengths of pendulums, beating seconds at other points would form a basis for the restoration of the standard foot should it ever become lost. It is probable, however, that the foot will before many years go out of use as a unit of measurement, and the meter become universally used instead.

F. R., of N. Y.—The advantage gained by condensation in steam engines, is not as many antitheoretical men suppose, owing to the accumulation of pressure on the side of the piston where the steam is acting upon it, but to the removal of the resistance of the pressure of the atmosphere upon the exhaust. This resistance can never be more than fifteen pounds, in round numbers. A mercurial column 28 inches in hight, balances about 14 lbs. atmospheric pressure to the square inch, subject to some variations for different altitudes, temperatures, etc.

F. O. N., of Mass.—A good cement for uniting iron pipes that will withstand the action of hot water, is made by mixing clean iron filings, or powdered borings, with powdered sal ammoniac and sulphur: 1 part by weight of sulphur, 2 of sal ammoniac, and 60 of iron. After mixing, sift coarsely and mix with water as it is used, to small quantities at a time.

B. F. P., of Miss.—Either the screw, or wheel and axle, of which gearing is a modification, have a power which is limited only by strength of materials. A given power will however raise more weight to a given time by a combination of gearing than by a screw, as the latter absorbs more of the power by friction.

T. H. M., of N. Y.—If you intend to invent a machine for setting and distributing type, you must familiarize yourself by personal examination, with the practical details of the business.

J. J. B., of Ohio.—To obtain an engineer's certificate you must possess a practical knowledge of the construction and operation of the steam engine.

H. F. U., of Pa.—Lime washes may be tinted with ochers, or other earthy pigments, the amount of which is regulated by the depth of tint required. The addition of a small quantity of glue and sulphate of zinc, will give greater permanency to the coating than it would possess without it. A little experiment will enable you to fix upon the right proportions.

J. W., of Ohio.—One equivalent of chlorine, and one equivalent of hydrogen form hydrochloric acid, no matter what means are employed to effect this combination.

J. A. F., of N. Y.—We should use brass to make the toy wheel of which you speak, making the step of soft metal and the shaft of hard metal.

S. W. W., of Mass., wishes to know of a process by which oil can be extracted from leather without injury to the leather; perhaps some of our correspondents may know of such a process.

J. R. G., of Pa.—A complete answer to your enquiry may be found on page 300, Vol. XVIII, of the SCIENTIFIC AMERICAN.

Mechanical Engravings.

Such as embellish the SCIENTIFIC AMERICAN, are generally superior to those of any similar publication, either in this country or in Europe. They are prepared by our own artists, who have had long experience in this branch of art, and who work exclusively for us. There is one pertinent fact in connection with the preparation and publication of an illustration in our columns, that needs to be better understood by many inventors and manufacturers who pursue a short-sighted policy in bringing their improvements to public notice. They often go to a large expense in printing and circulating handbills, which few care either to read or preserve. Now, we undertake to say, that the cost of a first-class engraving, done by our own artists, and printed in one issue of the SCIENTIFIC AMERICAN, will amount to less than one-half the sum that would have to be expended on a poorer illustration, printed in the same number of circulars, and on a sheet of paper in size equal to one page of our journal. A printed handbill has no permanent value. Thousands of volumes of the SCIENTIFIC AMERICAN are bound and preserved for future reference—beside, we estimate that *every* issue of our paper is read by no fewer than one hundred thousand persons. Parties who desire to have their inventions illustrated can address the undersigned, who are also prepared to send artists to make sketches of manufacturing establishments, with a view to their publication in the SCIENTIFIC AMERICAN. For particulars address

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Inventions Patented in England by Americans.

(Compiled from the "Journal of the Commissioners of Patents.")

PROVISIONAL PROTECTION FOR SIX MONTHS.

871.—MECHANISM FOR REGULATING THE TENSION OF THE WARP IN WEAVING LOOMS.—Munson Sigler, Paterson, N. J. March 22, 1869.

1,272.—RAILWAY CARRIAGE WHEEL.—H. D. Huguenin and A. M. Hazen Cleveland, Ohio. May 4, 1869.

1,324.—MOTORS, OR PUMPS FOR RAISING OR FORCING LIQUID OR ANIFORM BODIES.—J. B. Hood, New York city. May 5, 1869.

1,398.—REFRIGERATOR.—M. A. Hamilton, Detroit, Mich. May 6, 1869.

1,400.—SUSPENDERS OR BRACES.—T. J. Flagg, New York city. May 6 1869.

1,430.—BREECH ORDNANCE.—S. B. Dean, Boston, Mass. May 10, 1869.

1,435.—CASTING METALS UNDER PRESSURE.—J. J. C. Smith, of Somerville and J. A. Locke, Boston, Mass. May 11, 1869.

1,441.—STEAM AND OTHER ENGINES.—J. A. Marden, Boston, Mass. May 11, 1869.

1,458.—APPARATUS FOR THE MANUFACTURE OF ENVELOPES.—D. McConnell Smyth, Orange, N. J. May 7, 1869.

1,438.—HARDENING CHILLED OR CHILL CAST IRON AND STEEL.—Byron W. Nichols, Canton, Ohio. May 10, 1869.

1,440.—DETERGENT OR SAPONACEOUS COMPOUND.—Wm. H. Newton, New York city. May 11, 1869.

1,391.—TREATMENT OF CAST IRON FOR THE PRODUCTION OF WROUGHT IRON AND STEEL THEREFROM.—W. M. Lyon, Pittsburgh, Pa. May 6, 1869.

1,421.—FLUID METERS.—C. F. Jenny, New York State. May 7, 1869.

1,427.—GUN LOCK.—H. D. Hay and J. M. Hill, Crooked Creek, S. C. May 10, 1869.

1,417.—CONNECTING AND SUSTAINING THE RAILS OF RAILWAYS.—Samuel J. Reeves, Philadelphia, Pa. May 11, 1869.

1,459.—SAW TEETH AND MACHINERY OR APPARATUS FOR FORMING THE SAME.—R. J. Lusk, John Lough, Thomas Ritchie, Jas. Ross, and W. Lough, Buckingham, Canada. May 12, 1869.

1,450.—KNIVES AND FORKS.—Charles Moore, Westbrook, Conn. May 11, 1869.

1,490.—CARTRIDGES FOR BREECH-LOADING FIREARMS.—Isaac M. Milbank, Greenfield Hill, Conn. May 13, 1869.

1,509.—SLITTER CARS.—Ezra Haskell, Dover, N. H. May 17, 1869.

1,510.—REVOLVING FIREARMS.—Messrs. Smith & Wesson, Springfield, Mass. May 17, 1869.

1,512.—MACHINERY FOR FORMING THE THREADS OF METAL SCREWS.—T. T. Prosser, Chicago, Ill. May 17, 1869.

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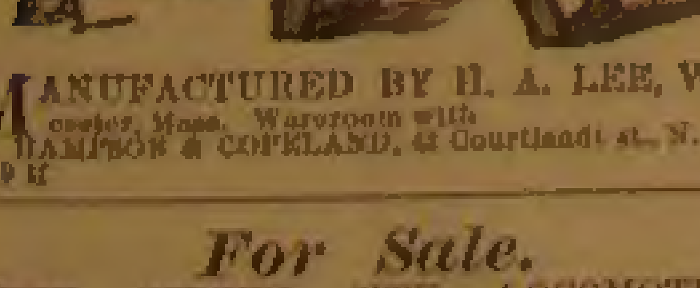

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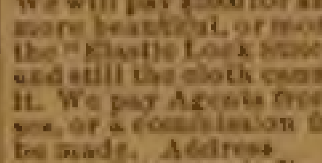

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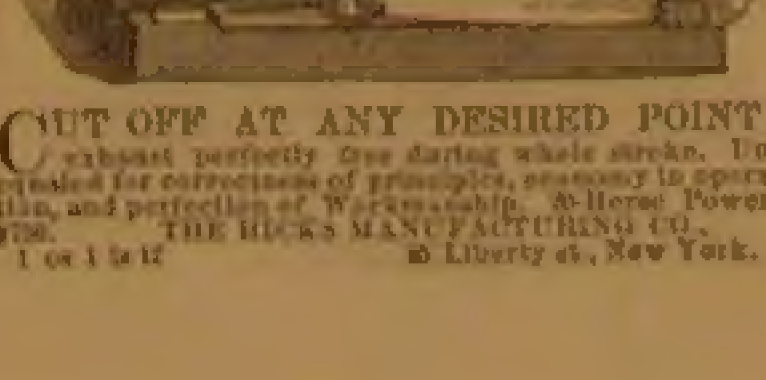

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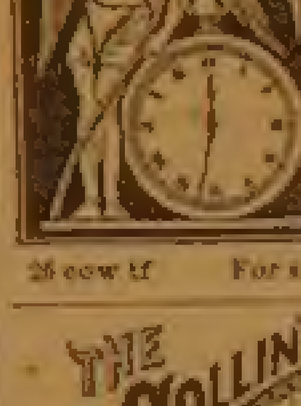

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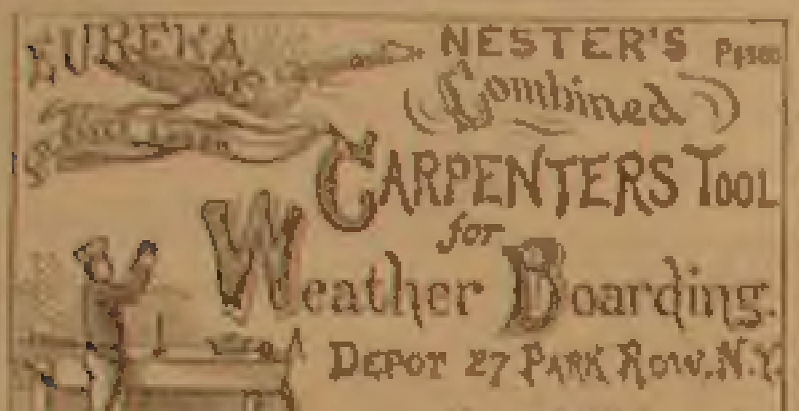

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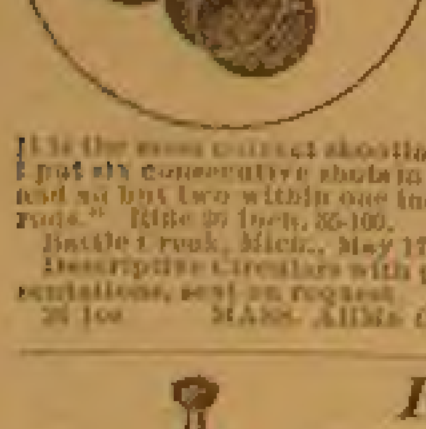

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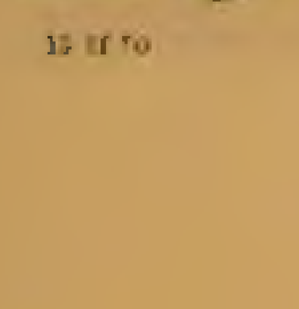

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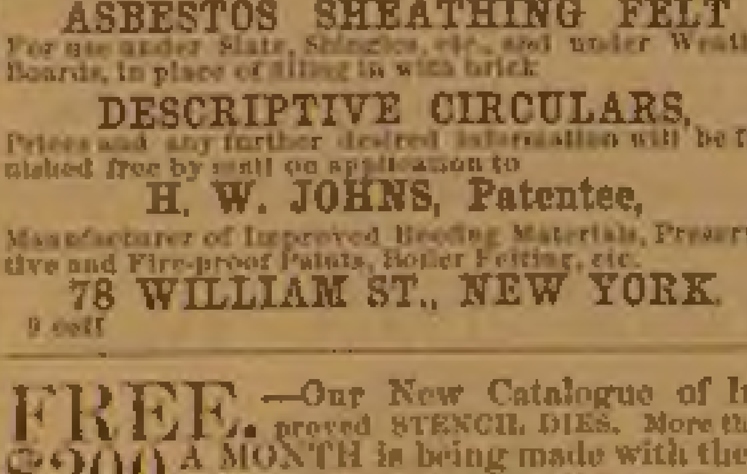

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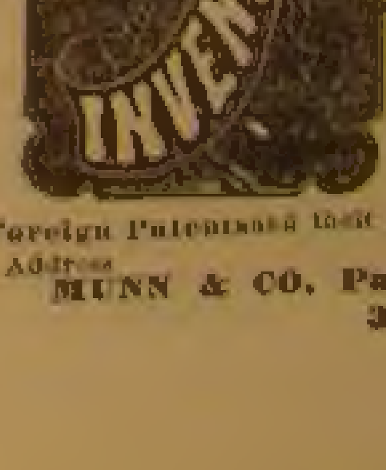

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